tortilis near many of the very temporary seasonal water holes on the surface of the pan. The grasses are generally short perennials such as Panicum repens, Sporobolus sp. and Cenchrus ciliaris, with taller species such as Cymbopogon sp. more conspicuous toward the northeast and Tragus sp. very evident in overgrazed areas near the stock route from bushman pits to Kazungula. As already noted, there is dense bush encroachment along this route dating back to 1949-50. It is most developed along the southwestern and western sides of the pan on lighter soils, and early stages in the development of thickets are clearly visible on the sand dunes to the south.

The pan is an important concentration area for game during the rains when large numbers of springbok, eland, zebra, wildebeest and gemsbok and smaller numbers of giraffe, lion, cheetah, elephant and hyaena focus on it. On one occasion in March 1966 over 2,000 head of game was estimated from a single point. There were some 1,400 springbok, 250-300 eland and over 200 zebra, together with 150-200 wildebeest, over 60 gemsbok and one black-backed jackal.

There have been suggestions from several quarters that this unofficial sanctuary should receive formal status, the latest of which is made by Blair Rains (1967) in "A Land Use Survey of the Northern State Lands, Botswana".

This advisor to Government on the potential for expanding the cattle industry in the northern state lands notes the exceptional opportunities for viewing game in this area and suggests its protection for this purpose. The proposed limits of the sanctuary would be as near the stock route in the west as the veterinary authorities could permit, latitude 19° 45' in the north, longitude 25° 00' in the east and the 20° 00' parallel or the old Maun - Francistown road in the south. An eight-mile wide corridor would link the area with the Botletle from the southwestern corner.

This suggestion forms a very useful basis for negotiation with representatives of other types of land use. It would also be desirable to consider including part of the Kanyu flats, as this is one of the last remaining portions of relatively undisturbed typical Makarikari country. Experience in the Bushman Pits area has demonstrated how very sensitive this type of country is to rapid deterioration through the mismanagement of livestock, and already there are clear signs of accelerating bush encroachment. One cattleman volunteered that this bush had started to become established in one particular part of the Kanyu flats during the past two or three years, since cattle from the stock route began to graze this far from water. The early stages of thicket formation around the northern rim of the salt-pan system, occurs in part of the 80 square miles referred to as 'F' by Blair Rains, in which he suggests a maximum stocking rate of 25 acres per animal unit, subject to the availability of water and to mineral deficiencies, not precluding livestock production. Even this stocking rate may be too high and it would seem advisable to maintain a very close watch for further deterioration in this grassland, irrespective of the primary form of land use to which it is to be devoted.

If the Nyai pan and some of the surrounding country is to become a game sanctuary, and this suggestion is fully supported by the present author, careful attention should be paid to its proper management. The results of the research now being carried out by a Fulbright scholar, into the biology of certain of the large mammals, should be of considerable value in determining this management and the precise limits of the sanctuary. The underground water in most of the area is highly mineralized, and if the management program adopted is to include the provision of artificial water holes, particular attention should be paid to the experience in providing saline water for several of the same species in the Kalahari Gemsbok National Park.

TOURIST DEVELOPMENT IN NORTHEASTERN BOTSWANA

Botswana is well placed to benefit from the rapid growth taking place in international tourism which has doubled to East and Central Africa during the last decade, and is expected to do so again in Central Africa by 1985. It is also in a good position to participate in the rapidly expanding Southern African tourist industry (table 27).

A positive and progressive policy recognizing wildlife as the basis of most tourism to Africa will assure Botswana of an increasing share of this valuable source of foreign exchange. More and more established resorts are becoming saturated, so that there is a very good opportunity for rapid growth in places like the Chobe and Moremi Game Reserves, as the demand for international tours continues to grow. This is well illustrated by recent increases in tourism to Rhodesia, where the value of foreign earnings has increased by 36 percent in two years to R11.2 million in 1965. The Wankie National Park is in a less attractive area than the Chobe Game Reserve, although the two have much in common, especially with regard to their proximity to the world-famous Victoria Falls, so that it is pertinent to note that the number of visitors to Wankie has increased by about 500 percent in 12 years. The value of the revenue now earned by Wankie (R54,452 in 1965) is almost half (49.5 percent) of the entire budget of the northwestern District Council, responsible for Ngamiland and the Chobe District.

Tourism should be coordinated throughout northeastern Botswana in order to make full use of local assets and to attract more visitors for longer periods. The Chobe and Moremi Game Reserves, the Okavango swamp and the proposed sanctuary incorporating the Nyai pan, are complementary in the remarkable diversity of their country and the variety of their wildlife and together offer an attractive combination on a circular tour.

There should also be the closest possible liaison between the Botswana tourist industry and that in neighbouring countries, in order to promote and coordinate tourism on a regional basis.

The following suggestions for development within the Chobe Game Reserve were made with this perspective in mind, particularly with the desirability of linking the Chobe Game Reserve with other tourist attractions in northeastern Botswana through the Moremi Game Reserve. The limited resources upon which a Government can depend for such development were recognized in the staged nature of the program which can be geared to the availability of capital. Considerable participation by private enterprise is envisaged in order to relieve the Government of much of the day-to-day administration of the tourist trade, although it is essential that it should retain very strict control over all private operations. Strict terms and conditions should be written into all agreements which should be prescribed to allow future expansion and avoid stagnating monopolies. If private enterprise is to erect tourist accommodation, agreements should provide for the proper supervision of the siting of all buildings, as well as their construction and maintenance. Minimum standards of service should be prescribed and prices regulated to within reasonable limits. Agreements must also contain an indisputable "wind up" clause and should provide for prompt retribution for any transgression of game reserve regulations.

Development in the Chobe Game Reserve

Present facilities for the public, centered on Kasane, are inadequate and many visitors are satisfied with a short stay in Botswana. There is therefore a pressing need for further development and an improvement in the amenities along the Chobe river, between Kasane and Ngoma.

TABLE 27

The growth in tourism in selected game sanctuaries in Rhodesia, South Africa, South West Africa, Zambia and Botswana

(Figures supplied by: (1) Rhodesian Department National Parks & Wildlife Management; (2) South African National Parks Board; (3) South West African Administration and, (4) Zambian Game and Fisheries Department)

Year	Annual visitors to sanctuaries											
	(1) Rhodesia		(2) South Africa						(3) S.W.A.	(4) Zambia		Botswana
	Wankie National Park	Victoria Falls National Park	Kruger National Park	Gemsbok National Park	Golden Gate National Park	Mt. Zebra National Park	Bontebok National Park	Addo Elephant National Park	Etosha Pan National Park	Kafue National Park	Luangwa National Park	Chobe Game Reserve	Moremi Game Reserve
1934			19.740										
1935			25.807										
1936			29.334										
1937			33.849										
1938			38.014										
1939			32.603										
1940			22.525										
1941			34.168										
-			-										
1946			37.166										
1947			45.465										
1948			58.739										
1949			66.080										
1950			71.279										
1951			82.761										
1952			89.393										
1953	c5.000		85.723						4180				
1954	-		91.106						4340				
1955	-		101.058	3.683			785		6210		549		
1956	11.500		105.183	4.145			805		7268		915		
1957	-		117.187	6.448			737		7141		938		

(continued..)

TABLE 27 (continued)

Year	Annual visitors to sanctuaries												
	(1) Rhodesia		(2) South Africa						(3) S.W.A.	(4) Zambia		Botswana	
	Wankie National Park	Victoria Falls National Park	Kruger National Park	Gemsbok National Park	Golden Gate National Park	Mt. Zebra National Park	Bontebok National Park	Addo Elephant National Park	Etosha Pan National Park	Katue National Park	Luangwa National Park	Chobe Game Reserve	Moremi Game Reserve
1958	15.500	10.975	116.849	6.548			1057		9598		1170		
1959	19.298	15.874	135.740	4.133			927		9872		1347		
1960	15.913	18.638	137.113	4.769			-		12690		1252		
1961	12.280	13.226	152.465	5.114			-		10729		2292		
1962	14.393	c35600	153.871	4.620		1.707	-		12118	2055	2022		
1963	20.244	c 35.200	180.044	5.562		1.521	8.562		23478	2053	2795		
1964	22.559	35.216	220.579	5.913	12.844	2933	9.996		32537	2053	1999		340
1965	25.351	35.134	255.398	5.924	15.887	5120	12.140	38.332	33346	-	-	2578	780
1966	-	-	264.596	-	-	6338	12.645	34.105	36584	-	-	2995	1560
% increase last 2 years	12.4	-*	3.5	-	23.6	23.7	4.1	-	9.7	-	-	15.0	** 50.0
% increase last 4 years	76.3	-*	46.9	28.2	-	31.66	32.2	-	55.8	-	-	-	-
% increase last 8 years	63.5	220.1	94.9	-	-	-	170.8	-	270.5	-	113.1	-	-

*Expansion limited by accommodation

**Approximately calculated from entrance fees.

Kasane should be looked upon mainly as a family holiday resort offering good hotel accommodation and residential plots, with the emphasis on fishing, and game viewing, and also water sports on the Chobe river between the game reserve and the Chobe rapids. The construction of a nine-hole golf course, between Kasane and Kazungula, would do much to attract and hold guests to the Chobe River Hotel. The efforts of this establishment to provide more accommodation and proper housing for its staff, should be encouraged. Attention should also be paid to the aesthetic appeal of the area around the hotel and approaching the northern entrance of the game reserve.

High-class accommodation and a camping site are needed at Serondela. The Government's intention to attract private enterprise to construct and operate the former and its plans to build the latter during 1967 should be of immediate benefit. It will also be necessary to demolish most of the existing shacks as soon as their leases expire. These developments will more or less saturate the area along the Chobe, and no further building should be permitted, except along the ridge between the game warden's house and Kasane, and west of Ihaha, where there is scope for two small tourist camps, together totalling not more than 40 beds.

Highway A72 needs to be rerouted further from the Chobe river between Kasane and Ngoma. This road was gazetted as a public road by Government Notice No.5 of 1960. At the time it was a primitive track, but with the establishment of the game reserve it was brought up to a standard suitable for use by saloon cars, by means of a R20,000 Colonial Development and Welfare grant to the game reserve.

The amount of traffic along the road has increased from a trickle in 1960 to over 8,000 vehicles a year, of which over two thirds are commercial vehicles, including heavy lorries, and only 27 percent of the vehicles belong to tourists visiting the reserve. The road is now the main access route to the eastern Caprivi from the south, and much of the traffic is fast moving.

The question of rerouting the road has been considered by several economic missions, and has generally received a fairly low priority, owing to the considerable cost of building an alternative road of similar standard. Nevertheless the present use of the road is incompatible with the interests of the national park. Through traffic is often noisy, impatient and disturbing to game and game viewers; it uses the road at all times of day and night, there has been an increase in road kills (including an elephant calf, bushbuck and smaller species), and is disfiguring the verges for a distance of over 50 yards with a heavy mantle of dust. A land rover travelling at less than 15 miles an hour produces very little dust, but at 20 miles an hour visibility is impaired for several minutes after the vehicle has passed. This is especially noticeable toward the end of the dry season. The road is already deteriorating as heavy transport breaks through the nine foot wide gravel strip, or destroys its edges, and as the road becomes progressively more corrugated it forces all traffic to speed up in order to ride these corrugations.

An alternative route from four to eight miles from the river has been selected and should be opened up as soon as possible. As a purely interim measure consideration could be given to making speeds in excess of 20 m.p.h. along the present road difficult, through the construction of artificial "hazards". All through traffic could be required to carry permits stating the time of entry at Ngoma or Kasane and should be penalized if it reaches the other end of the reserve in under a specified time. Finally, the road approaching Ngoma should not be improved until an alternative route is open.

There is also scope for an additional 50 miles of game-viewing tracks in this area, to further reduce the pressure of traffic on the roads in this, the most attractive part of the Chobe Game Reserve.

An early start is needed with development in other parts of the reserve as even with the improved amenities indicated above, it can be expected that the river front will become saturated within two to four years, particularly if a full-scale advertising program is mounted to publicize the reserve. It should be noted that until now the Game Department has been reluctant to advertise for fear of attracting more visitors than could be catered for, as this would be undesirable at this stage in the reserve's history.

Development away from the Chobe will depend largely upon the management of artificial water holes and should begin around the headwaters of the Ngwezumba river where the six bore holes are already being drilled. This area is some 40 miles south of Serondela and could support a fair sized rest camp and camping site along the northern edge of the Kakulwani plain near the Gokora pan. About 150 miles of inexpensive dry season game-viewing tracks could take advantage of hard ground in this attractive country, and in the eastern extension to the national park, where there is a mosaic of open plains, mopane veld, libalas and mixed Kalahari woodland. Game is already reasonably plentiful and should soon become conditioned to tourists, and the provision of inexpensive game-viewing blinds on the high banks overlooking the Ngwezumba pools would provide an added individualistic attraction.

From Ngwezumba bridge the main arterial road should follow hard ground along the river to link up with the present Kasane - Maun track near Tsotsoroga pan, and then follow this track on hard ground, through the proposed southern extension of the game reserve to the vicinity of Mababe village. Here it would turn west, through some sand, to the Moremi Game Reserve, a total distance of about 150 miles. A second road could go west from Tsotsoroga to the Savuti, but would have to traverse some soft sand in order to reach the Linyanti swamp. About 250 miles of game-viewing tracks could be laid, mostly on hard ground, in and around the Mababe depression.

There is room for three camps, two large and one small, in the Mababe but, although attractive sites could be suggested, the siting of camps will depend upon the occurrence of underground water, including potable domestic supplies. A preliminary survey undertaken near Tsotsoroga indicated only highly saline underground water, although there were indications of fresh water about five miles up the Ngwezumba valley away from the lip of the Mababe. Fresh water can be obtained from the sands in the Gxlegcauka plains, well into the dry season in most years and there is of course a good supply of fresh water at the Savuti when the channel is in flood. Bore holes sunk in the past near Jovorega suffered from fine silt which harmed the pumps, and all but one were brackish. This exception, thought to have been near the pan, yielded a weak supply of sweet water.

Administration

Any plans for tourist development should make provision for advertising and for the safety of visitors in the reserve. Meticulous care is needed with the signposting of all roads with elephant-proof signs, and all tourist movements, whether by road or air, will have to be coordinated and controlled to avoid visitors being stranded in remote and waterless areas. This will eventually mean a network of check points in radio communication with headquarters and staff and vehicles to assist people in difficulty.

Summary of Priorities for Development

Administration (offices, staff accommodation etc.), communications (roads, tracks, radios and airstrips) and water manipulation (bore holes etc.) would be the responsibility of the Government, which might then lease sites for tourist accommodation or, if funds allow, erect such accommodation and lease these buildings, camp sites, etc.

The following was the order of priorities suggested:

1. To provide for: (a) improved amenities in Kasane, (b) a high-class rest camp or lodge and a camp site at Serondela, and (c) additional game-viewing tracks in this area. At the same time work should begin on: (d) the road to Ngwezumba, (e) the rest camp to Gokora pan, (f) 150 miles of game-viewing tracks in this area, and (g) inexpensive blinds at the water holes in the river.

2. (a) To construct between 80 and 120 miles of road down the Ngwezumba river and into the Mababe depression, (b) to allow for water manipulation in the Mababe, (c) to allow for one camp and 100 to 150 miles of tracks in this area.

3. (a) To continue the main road through the Mababe to the Moremi Game Reserve and, depending on 2 (b), to construct two additional camps and further game-viewing tracks in the depression.

Note: Landing strips should be provided at tourist centers and administrative facilities should develop with roads, water manipulation and tourist areas.

MOREMI GAME RESERVE

The Fauna Conservation Society's aim to prohibit building within the Moremi Game Reserve is a worthwhile objective, but consideration should be given to allowing tourist accommodation just beyond its borders on the Kwaai and/or Mogogelo rivers.

This reserve would form an impressive link between the Chobe Game Reserve and the Okavango swamps, where early indications suggest there is a valuable potential for a unique type of safari. Operators pioneering this aspect of the tourist industry are worthy of continued government encouragement.

There is some heavy sand on the unmaintained track between Moremi and Maun, but the distance is only 50 miles. It is possible that a separate track for the exclusive use of light traffic would bridge this gap in a circular tourist route through northeastern Botswana, as there is a good all-weather road from Maun to Francistown.

This road passes through attractive plains country with scattered palms around the northern fringe of the Makarikari depression and the overall itinerary would be enhanced if the journey could be broken in a sanctuary at the Nyai pan. The country is very different from that so far discussed and a visitor would be introduced to springbok and gemsbok for the first time.

NYAI PAN SANCTUARY

Development in this area will depend upon the outcome of decisions relating to the future status of the area but, if retained for game viewing, it could support a reasonably large rest camp.

CONCLUSION

The popularity already enjoyed by the Chobe and Moremi Game Reserves, which have hardly been advertised, is testimony for the potential value of tourism, based on wildlife in northeastern Botswana, suggested by the rapid recent development of the industry in neighbouring states.

The Chobe Game Reserve in particular, and the region as a whole, are well placed and have the necessary attractions to share in this local manifestation of the world-wide increase in tourism. The Chobe Game Reserve is close to the Victoria Falls, has attractive country along the Chobe river, as well as in the east of the reserve, and in the Mababe depression, and has a wider range of large mammal species than any other sanctuary in southern Africa. If integrated with the Moremi Reserve on the edge of the Okavango swamps and the Nyai pan area in the Makarikari system, it would provide a valuable attraction for overseas visitors and the increasing flow of holidaymakers resulting from South Africa's rising prosperity.

PART III

SAFARI HUNTING

Organization

Safari hunting, based on the provision of expensive exclusive hunting tours organized by private companies, was introduced into Botswana in 1962. Even in the short time that has elapsed since then, this industry has developed into a valuable source of foreign exchange and direct revenue. The total direct revenue earned from hunting licences and hunting concession area fees amounted to approximately R80,000 of which R54,600 was derived through the safari companies. This included some R10,000 collected by district councils and R70,200 taken in concession fees and package licences, and compares with a total Central Government expenditure on the Game Department of R60,221.

Hunting is based on a system of concession areas in which the exclusive hunting rights for non-residents are leased to the companies operating the safaris (figure 3), on a pro rata cost basis, depending upon the maximum number of clients who may hunt in the area at any one time. There were seven companies registered in 1966.

The system has several advantages in that it is easy to administer and, by granting concessions for a number of years, encourages the companies to undertake certain types of development in their areas, required in terms of their agreements. This has resulted in the clearing of several airstrips and the opening up of dry season tracks. There are, however, weaknesses as not all operators have equally attractive hunting areas or ready access to the full complement of species on offer. Further, it threatens to restrict the number of firms which can be accommodated and so reduces competition.

These difficulties are only partially alleviated by the provision of "free areas" in which any non-residents, including the clients of safari companies may obtain permission to hunt, and the creation of three forms of package licences, which are designed to cater for the various regions in the country. In spite of the free areas, several firms are experiencing difficulty in obtaining the full range of species they require, while in other concessions there is an abundance of these same animals. Package licences tend to limit the numbers of any species which may be shot to the permissable off-take in the area, for which the licence is applicable, to the species which is least plentiful. The number of licences which can be sold is consequently limited by the maximum crop that can be taken from the most critical species on the licence. While the provision for supplementary licences, to increase the maximum bag for some species, does allow some flexibility, this does not permit an increase in the number of clients allowed in the area.

If concession areas were sub-divided into smaller units and tenders were invited for these units, it would overcome most of these difficulties, especially if the maximum off-take to be allowed from each area were set in advance. It would also assure the Government of a fair rental. The objection that this might curtail development by the companies could be answered by making allowance for such development when awarding the tenders for the subsequent period.

Control

The permissible crop from any wild population is governed by two factors. The first is the rate at which the population can replace the segment or segments being culled. This is obviously usually much lower for acceptable trophies than the actual recruitment rate for the sex and age class providing these trophies, as many individuals will be substandard in the eyes of the sportsman. The second limiting factor governing the off-take is the degree of control which can be exercised.

I would be beneficial to the Government and the safari companies, and to the long-term survival of the industry in the face of competition from conflicting forms of land use, including other types of hunting, if the throughput of clients could be raised. This requires more biological and administrative supervision, as wildlife is a sensitive national asset, the control and management of which should not be entrusted to private concerns which are bound to be motivated by relatively short-term prospects. It would be unrealistic to expect anything else from efficient business organizations operating under more or less restricted leases.

One of the major drawbacks to the present system, excluding those already discussed, is that it is difficult for the Game Department to guage accurately the game situation in the concessions without the close cooperation of the concessionaires. In particular it is important that the companies should supply regular standardized information on their hunting successes on an area by area basis.

It was therefore suggested that the Government should request or, if necessary, require the companies to comply with the following recommendations:

1. Professional hunters should complete the return illustrated in table 28, following each separate visit to a specific area. This is little enough to expect, especially if the forms are supplied in a convenient sized tear-out book. At most a hunter might have to complete one return at the end of a day's hunting, although generally only one would be needed after several days' sojourn in a given area.

2. The hunter should complete the return before leaving the area, and this should be a condition of his licence. In any case the forwarding of the returns should be the responsibility of the concessionaire, and a factor influencing the renewal of concessions.

3. Such a recording system, which is designed to place least burden on the Game Department and to cause the minimum inconvenience to hunters, requires that the limits of the recording areas remain completely unaltered. It would, therefore, seem advisable to subdivide the present large concessions into sub-units for this purpose at least, in order to allow maximum flexibility. Whole sub-units could then be changed from one concession to another, or reserved for some other form of land use, without invalidating all past records from an area or areas. These subdivisions should be based, as far as possible, on natural features and the use of arbitrary lines on maps avoided. Not only will this make location on the ground simpler, but a division along ecological lines is more likely to fit in with changes in land use.

The Game Department would naturally be responsible for ensuring that accurate records are kept and as much checking as possible should be done in the field. The system is designed to detect changing trends which may require further investigation and will not, therefore, yield results until it has been in operation for a number of seasons.

In conclusion, it should be noted that, although fuller information would be desirable, this rather crude system is designed to supply the Game Department's minimum needs for perpetuating the industry on a coordinated basis. The data should provide for improved efficiency and will supply factual evidence to bolster the case for this type of hunting, as and when conflicts arise over land-use policies. This point was emphasized during the recent survey into the expansion of the cattle industry in the Northern State Lands on which the author was requested to represent wildlife interests. These facts might be stressed while attempting to solicit the willing cooperation of the safari firms.

Hunting by Tribesmen in Concessions

Hunting by tribesmen in the concession areas is of concern to several of the companies and should be controlled especially where it involves non-residents of the particular area. New legislation recognizing the importance of subsistence hunting to many of the rural people, but seeking to control commercialized hunting or hunting by people with other adequate means of support, is a very progressive move in this respect.

Further Surveys of Concessions

It was not possible during the present assignment to survey the concession areas in northeastern Botswana adequately, and more work is needed to determine the status and trends in the wildlife populations and their habitats, particularly in areas away from the Chobe Game Reserve. In those areas which have been sampled, safari hunting is not a threat to the survival of most species, although in several cases deterioration of the habitat is. The usual pattern is a decline in the selective grazers accompanied by an increase in some of the browsing species, a number of which reached a peak in an eruptive phase and died in large numbers during the dry season following poor rains in 1965/66.

Such factors are important for determining the relative crop permissable in an area from a given species. It is unlikely that intensive management will be possible in the concessions for many years to come, but it is in the interests of the safari companies to limit burning, particularly early in the season. There are, however, certain circumstances in which restricted fires may be allowed under the strict control of the Game Department. These include the burning of small patches of swamp for the hunting of sitatunga, and of very limited areas of tall grassland, but in all cases particular attention should be paid to the need to rotate such burning. Similarly, where companies wish to provide artificial water holes, this should be encouraged only where there is adequate provision to ensure that the surrounding habitats are not decimated.

Lion - a Valuable Problem Animal

The existence of the safari hunting industry is largely dependant upon the availability of adequate lion to enable a reasonable proportion of the clients to obtain a satisfactory trophy. On the other hand, the species is in conflict with livestock production and stock owners have the right to protect their property. The problem is emphasized on the fringes of important ranching areas and along stock routes through some of the major concessions, and there is no question that certain people delight in the opportunity to shoot as many lion as possible on the pretext of defending livestock.

The species has disappeared from much of its former range in southern Africa, and needs adequate protection in the concession areas, but, more especially it needs protection from unnecessary persecution in marginal ranching areas. Where it is necessary to kill troublesome individuals, the extent of the hunting should be tempered with the knowledge of the species value to the national economy.

TABLE 28

AREA REPORT - SAFARI HUNTING

(GAME RETURN)

Professional hunter's name _____ Company _____
Date _____ Concession Area _____ Number of guns _____
Length of time in area _____ days hunting. Number in party _____ (1)
_____ days not hunting.
_____ total
Reason for days spent not hunting: moving camp, illness, licence full, photographing, resting, (2)
Rounds of rifle ammunition expended _____

Species	Number on licence (3)	Number required by client (4)	Number shot or wounded	Number shot at and missed	Size (5)	Remarks
Elephant Lion Buffalo Sitatunga Kudu Bushbuck Roan Sable Impala Gemsbok etc. etc.						
Total						

(1) Number of guns under the guidance of the individual hunter.

(2) Delete whichever not appropriate.

(3) Number covered by original licence(s) including supplementary licences taken out while in the area, should be indicated in brackets adjacent to the original number.

4) Indicate client's aspirations when entering the area, even if more game is shot, and any trophies subsequently shot on supplementary licence should again be included in brackets.

5) Size. Given horn length in the case of antelope, the total weight of both tusks in the case of an elephant (note if single tusker), tusk length for pigs and total length for other trophies. All measurements to be done according to the standards laid down in Rowl and Ward, except that all measurements will be done on fresh material.

Conclusion

There is a considerable potential in Botswana for earning valuable foreign exchange from recreational hunting, but this requires adequate protection of the sensitive, renewable, natural resource on which it is based. One of the best ways of realising this potential is by fostering the safari hunting industry, which should be encouraged to expand within the limitations imposed by the biological productivity of the species providing trophies and the Game Department's ability to supervise such hunting. This requires certain essential basic data and greater flexibility than can readily be achieved with large corporate concessions, and a limited range of package licences, which preclude an optimum off-take from the majority of species.

PART IV

GAME RANCHING

Introduction

Recent moves to organize game ranching, or the culling of wild populations for the production of protein and other useful animal products on a sustained yield basis in southern Africa, have often been mistaken as advocating a revolutionary form of land use. In fact, they are an attempt to rationalize the oldest type of land use known to man in the light of modern knowledge and developments, and in the face of increasing human populations.

The importance of hunting by the residents of Botswana to the general economy of the country, and in particular its importance in some of the poorer rural areas, should not be underestimated, nor should the continued productivity of the extensive large mammal populations be taken for granted. In some parts subsistence hunting provides the major source of protein in the diet of the people, and a recent FAO report (Amaral, 1965) estimated that about a quarter of the animal protein consumed in Botswana was derived from wild animals. Their skins and hides provide almost the only source of income to the peasants in some parts, while the collecting of bones found in the veld is also important in others.

It is difficult to place a monetary value on this industry as there is hardly any separate record for the sale of game products, and those figures which are available are scattered. Further, it is difficult to judge its true significance to sectors of the community which have not as yet developed a cash economy. There are, however, several indications, such as the results of surveys undertaken on the feeding habitats of bushmen (see for example Silberbauer, 1964), the growing importance of sales of hides and skins, the obvious profitability of the sales of dried meat in settlements such as Maun, and the importance of wild animals as a source of food especially in dry years in many areas. It would be well worth attempting to evaluate the gross annual value of these activities in Botswana.

Game ranching, under prevailing circumstances, can be divided into two aspects: the production of saleable protein and the production of saleable by-products, particularly the trade in hides and skins.

Hide and Skin Trade

This trade has been important in large parts of Botswana for many years and could provide the basis for an increasingly valuable secondary industry. This will require the proper supervision of the business, for which it is essential to have adequate information upon which to base administrative and biological control.

There is legal provision for traders to submit regular returns of their dealings, but this does not appear to have been enforced. There is also a fair amount of useful information scattered about the country in the records of trading companies and Government Departments. For this reason the Government has sought assistance with a survey to collect

and collate this information, with a view to determining its usefulness and, if necessary, suggesting modifications of the form in which it should be regularly submitted in the future. This study is at present being carried out by Dr. von Richter.

The information required of dealers should be designed to facilitate strict legal control and to provide an indication of changing trends in the most important populations harvested for their skins, so that safe yields can be set. The first calls for the closest possible cooperation between the game authorities and the Veterinary Department, which is responsible for regulating the movement of animal products, both within the territory and for export.

The determination of safe yields also requires a better understanding of the species' biology, so that appropriate investigations along these lines would form a logical second phase to the suggested survey. In several instances it would be a matter of relating the existing knowledge of a species' biology to local circumstances, while for other species there is a need for original research into their habitat requirements, productivity, growth rates, etc. Appropriate means of hunting or trapping should also be investigated and, if possible, the best methods of curing and storing skins should be tested and demonstrated to the local people, as current wastage through the improper treatment of hides and skins is high.

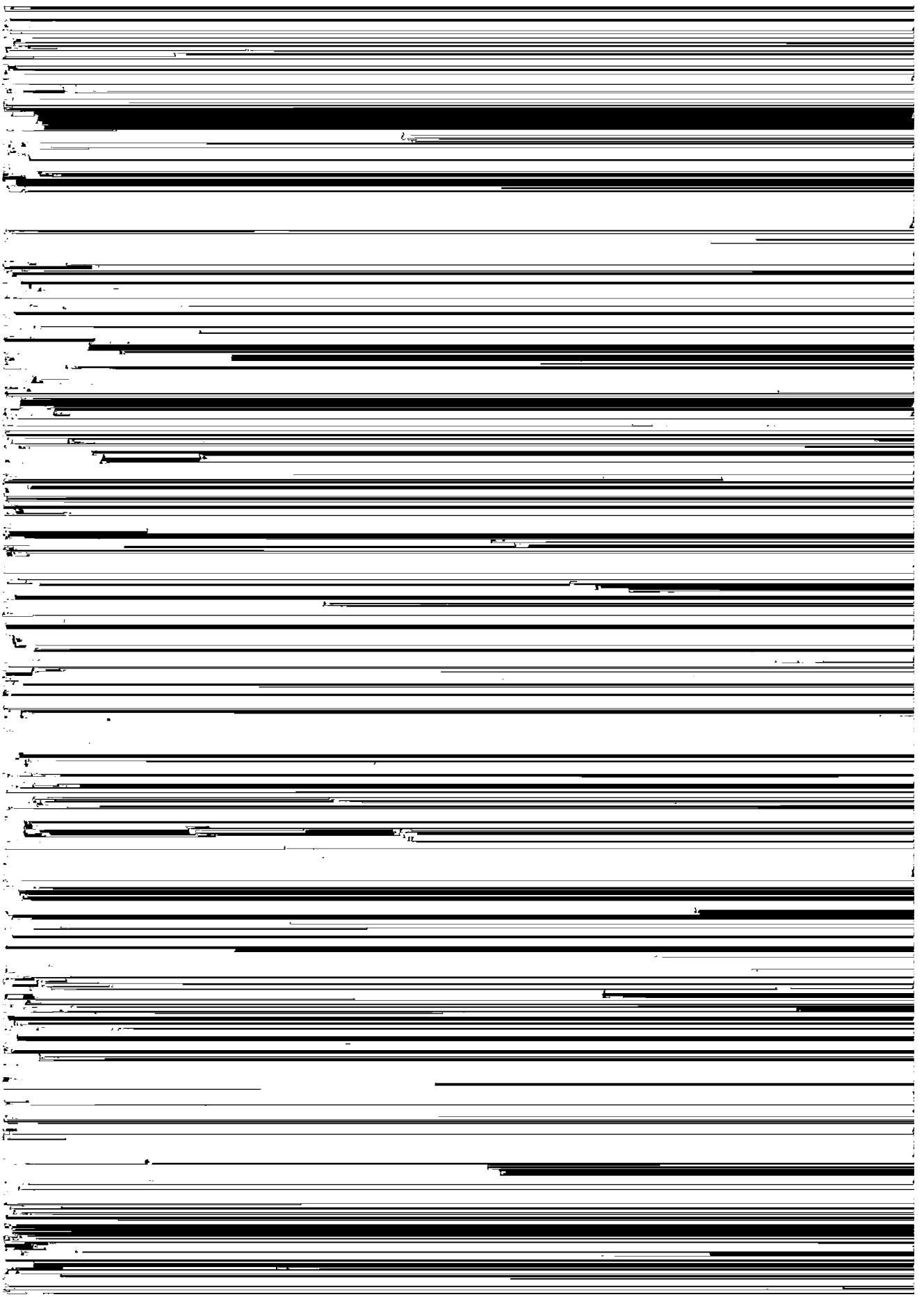
A rapid increase in the prices offered for many skins during the past 12 months, makes such a survey and the proper organization of the industry rather urgent. While the prices indicated in table 29 are to be welcomed, for the greatly increased amounts paid to the primary producer who in many cases are villagers in remote areas, they do constitute a double-edged weapon. For perhaps the first time, the large-scale hunting of animals for their skins alone is now possible on a commercial basis.

The above remarks apply to the hide and skin trade in general. It is equally important that the history and continued exploitation of crocodiles in the Okavango swamps should be documented.

Commercial Protein Production

Wild populations of large mammals can be made to yield valuable quantities of highly palatable protein on a sustained-yield basis, in much the same way as fish populations for example. In theory, a spectrum of wild animals, that have evolved under native conditions, is more efficient in the production of meat and less destructive to its habitats than one or more introduced species. In fact this is the case in many marginal lands, such as extend over much of Botswana and where current livestock production is leading to serious veld deterioration.

There are, however, several difficulties to putting this meat into the cooking pot on a commercial scale. Neither should the following brief discussion be construed as suggesting that the valuable cattle industry should be replaced by wildlife. Rather, it is intended to draw attention to the possibilities for integrating the use of wild animals into the production of saleable protein. This might take the form of using one or more species, along with livestock, in order to diversify the harvest from an area, so as to raise profits, or so as to reduce the primary crop in order to allow the area to heal from past malpractices; or certain species of wildlife, particularly browsing forms, may be allowed to replace livestock, at least temporarily, while areas that have been seriously downgraded are allowed to recover; or wildlife may provide the primary crop in areas which are unsuited to livestock through being too sensitive to trampling etc., lacking suitable water or through the presence of tsetse fly. In any case the systematic elimination of game, as has also been suggested, would be a retrogressive move in the wise exploitation of the nation's natural resources.



Hunting associated with the control of tsetse fly in one small area around the fringe of the Okavango swamps led to the destruction of 60,638 head of game in 23 years without endangering most of the parent populations (Child et al, Ms). This hunting produced 4,702 animals from over a dozen species in 1964 alone. While the hunting did not only cull populations resident in the primary hunting area of about 220 square miles, it did demonstrate the high productivity which can be expected around the fringe of the swamps. At current prices in neighbouring Rhodesia (Roth, 1966) the meat and skins, if properly processed, would have been worth over R95,000 (table 30). A lower productivity could naturally be expected from drier areas, but here there are also species such as springhares, which have proved very saleable in Rhodesia, and other smaller species, whose pelts are valuable and which were not included in the above calculation.

Problems which will probably be encountered by any large-scale operations include the transportation from remote areas over poor roads, of fresh or processed meat, for which a market would have to be found. There would also be questions of health inspection and the possible spread of livestock disease, and the need for developing harvesting techniques applicable to local conditions. Some of these problems would be answered by converting the wild animals into a powdered form of stock feed, as has been suggested, but this would seem a highly inefficient method of transforming herbage into saleable protein.

Recommendations

Every encouragement should be given to the controlled commercial exploitation of wildlife populations, especially to the production of hides and skins. Schemes for the production of protein might begin on a small scale, with the object of developing local markets in order to release more beef for export, although in so doing they would have to compete with the very low prices of meat from livestock. Elaborate schemes should receive support only where there is every indication that they will succeed, as expensive failures may further seriously retard the development of the industry.

Very close cooperation should be sought, at an early stage, with the health and/or veterinary authorities, in order to coordinate and control the industry along sound lines. The possibilities for integrating wildlife utilization with other forms of land use should be fully explored and, in this context, it is important to educate people into recognizing the significance of individual species, instead of the whole range of wild animals under the composite title of "game", as some species may create problems while others, including some of the smaller ones, may provide the opportunity for increasing the value of farming ventures.

TABLE 30

Value of meat and skins of animals shot on Tsetse Control on the Maun Front in 1964 according to the lowest ruling prices in Rhodesia (after Roth (1966))

Species	No. shot	Mean dressed carcase weight in lbs.	Weight of dressed carcases in lb.	Prices (in sh)	Value of shot game £ s.d.	Price per skin (in sh)	Value of skins £ s.d.
Buffalo	618	650	401,700	1/3	25,106.5.0	40	1,236.0.0
Kudu	385	250	96,250	1/3	6,015.12.6	25	481.5.0
Wildebeest	50	263	13,150	1/3	821.17.6	25	62.10.0
Tsessebe	40	190	7,600	1/3	475.0.0	25	50.0.0
Impala	617	60	37,020	1/3	2,313.15.0	7	215.19.0
Reedbuck	531	85	45,135	1/3	2,795.18.9	7	185.17.0
Warthog	916	70	64,120	1/3	4,007.10.0	4	183.4.0
Duiker	1067	21	22,407	1/3	1,400.8.9	2/6	133.0.9
Steenbuck	376	115	4,324	1/3	270.5.0	2/6	47.0.0
Lechwe	28	109	3,052	1/3	190.15.0	7/6*	10.10.0
Zebra	38	418	15,884	0/9	595.13.0	440	836.0.0
Other large antelopes**	13	230	2,990	1/3	186.17.6	25*	16.5.0
Total Total value of meat and skins	4679	-	713,632	-	44,180.18.0	47,638.8.9 R95,276.88	3,457.10.9

* estimated value

** includes sable, etc.

PART V

GENERAL

In terms of the request of the Honourable Mr. A.M. Dambe, Minister responsible for Wildlife, in August 1965, and subsequent requests from the Ministry, mention is made of several wildlife matters which,although not directly concerned with the present survey, were pertinent to it.

Reorganization of Game Department

The strengthening of the Game Department at all levels was one of the major recommendations suggested by Riney and Hill (1963). This led to the appointment in 1965 of a Game Advisor, by the Ministry of Overseas Development, London, to advise Government on the organization of the Game Department. It has not been possible to effect all the recommendations proposed by Kinloch (1965 a and b), for financial reasons, but there has been a very welcome improvement in the staffing and equipping of the Department, culminating in the appointment of a Chief Game Warden, under the OPEX Scheme.

The Department consisted of one Senior Game Warden, three Wardens or their equivalent, one Assistant Warden and 31 junior members of the permanent staff in 1965, all of whom were poorly equipped, especially with regard to transport. The establishment was strengthened by the appointment of the Chief Game Warden, one additional warden and 5 junior officers in the first half of 1967, and the whole Department had better equipment.

The Department is still very small for the many and varied duties it must perform in a large area, but the amount of growth which has taken place is encouraging evidence of the Government's real desire to foster the wildlife industry. This is also borne out by recent legislation which will make the task of administering the resource much easier.

Inservice Training

This report places considerable emphasis on the need for more knowledge as a basis for defining biological or other problems pertaining to wildlife and its relationship with other forms of land use, and for promoting better supervision of the various aspects of the industry. Much valuable information can be obtained by all ranks of field staff, if they are made aware of this need and if standardized methods of reporting are devised. Several of the wardens have undertaken extensive surveys and have detailed knowledge of remote parts but, unless this information can be made readily available, it is of little benefit to the Department. It is, therefore, strongly suggested that a system of regular in-service training should be instituted.

Such training should cover, by stages, all aspects of an officer's duties and should introduce him to the overall objectives of the Department and of wildlife conservation. The possibility of obtaining help with this training from such institutions as the United Nations Development Program sponsored College for African Wildlife Management at Mweka, Tanzania, should be explored.

Research

Some excellent research work has been concluded or is in progress on various aspects of the biology of Botswana. This includes faunal and floral surveys as well as more detailed work on the life histories and the behaviour of several important species. Studies worthy of particular mention include those of the Fulbright Scholar, presently working on large and small mammals in the Botletle river - Nyai pan area, and the Botswana Mammal Survey being done under the auspices of the National Museums of Rhodesia.

The latter is partially financed from Botswana and is being undertaken in cooperation with the Game Department, the Smithsonian Institute in the United States, and several other individuals and organizations. The present assignment, for instance, has been instrumental in contributing some 3,000 specimens of large and small mammals. The mammal survey is now approaching completion and is a good example of the usefulness to Botswana of this type of cooperation. Not only will it provide a good indication of the distribution of mammals and of certain aspects of their biology, but it has acted as a focus for other valuable information. It has also provided an organization to which two Fulbright Research Scholars could be assigned.

It is the Game Department's policy to continue to encourage biological research, although it will only be able to give active assistance to a limited number of workers investigating problems of particular interest to the Department. It is, however, important that all such research should be coordinated and that the Department should be fully aware of its aims, progress and results.

The author was honoured by the Minister, the Hon. Mr. J. Haskins, with a request for ideas as to the conduct that could be expected of visiting wildlife research workers. It was suggested that they would naturally be expected to comply with all regulations applying in their study areas, or where special exceptions were made on their behalf, to adhere rigidly to the provisions of such exceptions. The onus should rest with them for obtaining approval for any actions which are not normally permitted to ordinary members of the public.

A proper system by which workers notified the Department of their intentions and then periodically reported on their activities was advocated. People intending pure research or entering the country without specific terms of reference agreed to by the Government, should be required to submit detailed work plans within a reasonable time after arrival. These would naturally be flexible, but would specify the proposed study and would serve to inform the authorities and others interested in the field of work planned or in progress, so minimizing unnecessary duplication.

These plans should describe the objectives of the investigation, its value (which may be purely theoretical), the methods to be tried, and the personnel to be employed or whose assistance and cooperation is to be sought. The opportunity is then provided for the Government to assess which projects merit assistance and which it might be inadvisable to attempt. This can be beneficial to the worker as it frequently prompts suggestions from people familiar with local conditions.

It is also very desirable that researchers should report their progress periodically, in relation to their work plans, by a method appropriate to the type and duration of their investigation. The plans may be modified or new ones suggested and there should be an indication of the worker's program for the next period in the field.

All investigation should culminate with a report or reports the form of which will vary from reports to the Government to technical papers appearing in scientific journals.

It would be natural to expect several copies of such reports or papers to be lodged with the Game Department and in the case of results the publication of which will be delayed, a somewhat detailed account should be supplied in advance. The last could take the form of an elaborated final progress report.

Two points have arisen since these recommendations were made. The first is the need for retaining in an accessible form useful observations, which a research worker may not wish to publish himself, but which may be valuable to others. The Botswana Game Survey cards, on which selected members of the public have contributed to the knowledge of the fauna, could readily be adapted for this purpose.

The second and greatest need is for a small organization storing the documented results of past surveys and investigations, in order to save duplication. A great deal of valuable work has been undertaken by people in a variety of disciplines from time to time, since the first missionaries entered what is now Botswana, but their writings are difficult to trace, even when they are known. This disadvantage has been expressed by members of at least two Government Departments and it is to be hoped that the recently established Government Archives,or some similar organization, will be able to cater for this need.

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APPENDIX 'A'

A PRELIMINARY CHECK LIST OF THE BIRDS OF THE CHOBE GAME RESERVE

BY

Graham Child
C. Patrick Hepburn, and
Wolfgang von Richter

The obvious need for a working check list of the birds of the Chobe Game Reserve prompted the compilation of this list. It is based on Smithers (1964), "A Check List of the Birds of the Bechuanaland Protectorate and the Caprivi Strip" (Published by the Trustees of the National Museums of Rhodesia, 186 pp.), augmented by over 340 specimens collected between June 1965 and May 1967. These specimens are indicated in the list, which contains notes on significant extensions of a species range in Botswana, or additional breeding data which has become available. There are five species not so far recorded in Botswana, of which two were represented by collected material. The other three are conspicuous forms, but in accordance with accepted practice, specimens should be collected in support of the visual records. Further collecting of a general nature is also desirable in the drier parts of the reserve away from the Chobe river.

The list does not contain a number of passage migrants which have not so far been taken in this part of Botswana, although they are likely to cross it. It nevertheless shows over two thirds of the species known to occur in the entire country.

Mr. Jali Makawa, a collector of many years' experience and now based on the National Museum of Zambia, Livingstone, collected most of the specimens of which Mr. M.P. Stuart Irwin of the National Museum of Rhodesia, Bulawayo, confirmed our field identifications and undertook subspecific determinations. Mr. A.N.B. Masterson and Dr. C.R. Saunders contributed much of the breeding data. We are grateful to these individuals and organizations for facilitating the survey.

ANNOTATED LIST

Numbers follow Smithers (1964); f= female; m= male; c = clutch size; ‡ = new record for Botswana.

1. Struthio camelus — Ostrich

   7 one third grown chicks Nyai pan; 7 chicks 18 ins. tall; 8, 12 ins. tall; 5, 18 ins. tall, Makalamabedi Gate, Feb., 1966. (All records from outside Chobe Game Reserve).

2. Podiceps rufficolis — Dabchick

   One third grown chicks, Goha pan, April 7, 1966.

4. Pelecanus onocrotalis — White Pelican

5. P. Rufescens — Pink-backed Pelican

6. Phalocrocorax carbo — White-breasted Cormorant

7. P. africanus — Reed Cormorant

8. Anhinga anhinga — Darter

Two colonies, one of over 60 nests with C/3, C/2, C/1 eggs and young, Kasane and Zambezi river, July 1966.

†. Ixobrychus minutus — Little Bittern

Visually recorded Kasane (C.P. Hepburn, W. von Richter).

11. I. sturmii — Dwarf Bittern

1 m. coll. Kwikampa pan, March 1967; 1 m. coll. Savuti "swamp", April 1967. Both give considerable extension of species range in Botswana.

12. Nycticorax nycticorax — Night Heron

13. N. leuconotus — White-backed Night Heron

14. Ardeola ralloides — Squacco Heron

15. A. ibis — Cattle Egret

16. Butorides striatus — Green-backed Heron

1 m. coll. Kasane, May 1967; 2 nests C/3 Chobe rapids and Zambezi river, July 7, 1966.

17. B. rufiventris — Rufus-bellied Heron

18. Egretta ardesiaca — Black Heron

19. E. alba — Great White Heron

20. E. intermedia — Yellow-billed Egret

22. Ardea cinerea — Grey Heron

23. A. melanocephala — Black-headed Heron

Visually recorded Chobe river, giving marked extension of range, by C.P. Hepburn.

24. A. goliath — Goliath Heron

25. A. purpurea — Purple Heron

26. Scopus umbretta — Hamerkop

Nest C/6, July 9, 1966.

27. Ciconia ciconia — White Stork

29. C. abdimii — Abdim's Stork

30. C. episcopus — Wolly-necked Stork

One specimen coll. Savuti from over 300 on Jan. 12, 1967; 2 visually recorded Nunga, outside Chobe Game Reserve by G. Child, Oct. 1965. Both give marked extension of species known range.

31. Ephippiorhynchus senegalensis — Saddlebill Stork

Nest used for several years near Serondela; 2 chicks 18 ins. high on "knees" June 17, 1966; had just left nest Aug. 1966.

32. Anastomus lamelligerus — Openbill Stork

33. Leptoptilos crumeniferus — Marabou Stork

One specimen coll. Kasane July 9, 1965; nesting colony Linyanti swamp July to September 1966.

34. Ibis ibis — Wood Ibis

35. Threskiornis aethiopicus — Sacred Ibis

36. Bostrychia hagedash — Hadada

37. Plegadis falcinellus — Glossy Ibis

38. Platalea alba — Spoonbill

39/40. Phoenicopterus sp. — Flamingo sp?

Visually recorded Kasane (G. Child et al).

42. Dendrocygna viduata — White-faced Duck

1 m. coll. Gokora pan, March 20, 1967.

43. Alopochen aegypticus — Egyptian Goose

45. Plectopterus gambiensis — Spur-wing Goose

Young on pans in the Mababe March and April 1966. 3/4 grown young Nanyanga April 9, 1967. One third to 1/2 grown young on pans in the Mababe, May 1967.

46. Sarkidiornis melanotos — Knob-billed Goose

1 m., 2 f. coll. Savuti, April 12, 1967; 1 m., 1 f. coll. Goha pan, April 12, 1967.

47. Nettapus auritus — Pygmy Goose

1 m. coll. Kasane, April 27, 1967.

49. Anas undulata — Yellow-billed Duck

50. A. erythrorhyncha — Red-billed Teal

1 m. coll. Goha pan, April 16 1967; 1 f. coll. Gokora pan, March 20, 1967. ½ grown chicks Jovorega pan, April 6, 1967.

51. A. hottentota — Hottentot Teal

55. Thalassaornis leuconotus — White-backed Duck

56. Neophron monachus — Hooded Vulture

57. Aegypius tracheliotus — Lappet-faced Vulture

59. Gyps bengalensis — White-backed Vulture

Nest C/1 egg, Kabulabula, July 6, 1966.

60. Aegypius occipitalis — White-headed Vulture

61. Gypohierax angolensis — Palm-nut Vulture

65. Circus aeruginosus — Marsh Harrier

66. Polyboroides ratiatus — Gymnogene

‡ Pandion halietus — Osprey

Visually recorded several times along the Chobe river (C.P. Hepburn).

67. Terathopius ecaudatus — Bateleur

68. Circaëtus gallicus — Black-breasted Harrier-Eagle

69. C. cinereus — Brown Harrier-Eagle

70. Accipter badius — Little-banded Goshawk

1 m. coll. Kwikampa pan, March 19, 1967; 1 m., 2 f. coll. Kasane, April/May 1967.

‡ Machairamphus alcinus — Bat Hawk

Visually recorded Kasane (C.P. Hepburn).

73. Melierax metabates — Dark Chanting Goshawk

75. M. gabar — Gabar Goshawk

76. Kaupifalco monogrammicus — Lizard Buzzard

1 f. coll. Kasane, April 21, 1967.

‡ Lophaëtus occipitalis — Long-creasted Eagle

Visually recorded at Kasane (C.W. Benson, May 1965; G. Child, Jan. and Aug. 1966) and at the Savuti (C.P. Hepburn and W. von Richter, April 1967).

81. Aquila rapax — Tawny Eagle

82. A. wahlbergi — Wahlberg's Eagle

83. Haliaëtus vocifer — Fish Eagle

Nine nests checked July 6 to 9, 1966. 2 had one egg; one had two chicks; 4 had one egg and one chick; 2 had one chick. All the eggs were well set and all the chicks were very small indicating a very restricted breeding season, possibly related to seasonal floods of the Chobe river. A total of at least 18 nests were occupied along 25 miles of river at this time in the Chobe Game Reserve. Young leaving from several nests tended to band together in about September when up to 12 young birds were seen together.

84. Milvus migrans — Yellow-billed Kite

85. Elanus caeruleus — Black-shouldered Kite

1 m. coll. Kwikampa pan, March 18, 1967.

88. Falco biarmicus — Lanner Falcon

90. F. dickinsoni — Grey Kestrel

96. Sagittarius serpentarius — Secretary-bird

97. Francolinus coqui — Coqui Francolin

1 m. coll. Kwikampa, March 19, 1967; 5½ grown chicks Ngwezumba Bridge, April 14, 1966.

98. F. sephaena — Crested Francolin

1 f. coll. Kasane, April 28, 1967; 1 f. coll. Nanyanga, May 31, 1967. 2-6 day old chicks Kasane, Jan. 22, 1967.

100. F. adspersus — Red-billed Francolin

2 f. coll. Kasane and Serondela, March 1967; Eggs found Moremi and Kwai R., Mid-end April (P. Smith); Many small chicks 1/4 to 3/4 grown June to Oct., S. Mababe and Kasane/ Simwanza area.

102. F. swainsoni — Swainson's Francolin

1 m. 2 f. coll. Kwikampa/Gokora pans March 1967; 1 f. coll. Kasane May 5, 1967; Many 1/4 to 3/4 grown chicks Mababe and Kasane/Ilhaha area June to Sept.

104. Coturnix delegorguei — Harlequin Quail

105. Humida meleagris — Crowned Guineafowl

108. Crex egregia — African Crake

110. Porzana porzana — Spotted Crake

111. Limnocorax flavirostra — Black Crake

1 f. coll. Kasane, Dec. 12, 1965; 1 f. 2 m. coll. Kasane April/May 1967.

113. Gallinula angulata — Lesser Moorhen

2 m. 2 f. coll. Kasane April/May 1967; Very common on small pans in mopane on stock route to E. of Game Reserve and near Jovorega pan in early April 1967 when many had ½ grown chicks.

114. G. chloropus — Moorhen

1 f. coll. Goha pan, April 16, 1967.

115. Porphyrio porphyrio — Purple Gallinule

1 f. coll. Kasane, April 25, 1967; gives considerable extension of range in Botswana.

116. P. alleni — Lesser Gallinule

1 f. coll. Kasane, April 1967; gives considerable extension of range in Botswana.

118. Podica senegalensis — Finfoot

Visually recorded at Kasane (C.P. Hepburn)

119. Grus carunculatus — Wattled Crane

120. Balearica pavonina — Crowned Crane

121. Otis Kori — Kori Bustard

122. Eupodotis rufierista — Red-crested Korhaan

125. Lissotis melanogaster — Black-bellied Korhaan

126. Actophilornis africanus — African Jacana

2 f. 1 m. coll. Kasane April/May 1967; c/4 fresh eggs Kasane, April 12, 1967.

127. Microparra capensis — Lesser Jacana

128. Burhinus capenses — Dikkop

1 m. coll. Kasane, May 24, 1967.

129. B. vermiculatus — Water Dikkop

2 f. coll. Kasane, Jan. 6, 1966 and March 6, 1967.

130. Hemiparra crassirostris — Long-toed Plover

1 m. 1 f. coll. Kasane April 27 and 26, 1967; gives expected extension of range in Botswana.

131. Hoplopterus armatus — Blacksmith Plover

1 m. coll. Kasane April 21, 1967; 1 f. coll. Nanyanga May 31, 1967.

132. Stephanibyx coronatus — Crowned Plover

1 m. 1 f. coll. Nanyanga, May 30 and 31, 1967.

133. Lobivanellus senegallus — Wattled Plover

1 f. coll. Satau (Kachikau Enclave), April 13, 1967.

135. Charadrius pecuarius — Kittlitz Sandplover

1 m. 1 f. coll. Savuti, April 13, 1967; gives marked extension of range in Botswana.

136. C. tricollaris — Trebel-banded Sandplover

1 m. coll. Savuti, April 15, 1967.

137. C. alexandrinus — White-fronted Sandplover

142. Tringa glareola — Wood Sandpiper

1 m. coll. Savuti, April 13, 1967.

143. T. Hypoleucas — Common Sandpiper

144. Gallinago nigirpennis — Ethiopian Snipe

1 f. coll. Kwikampa pan, March 20, 1967.

† Gallinago media — Double Snipe

1 m. coll. Kwikampa pan, March 20, 1967.

149. Himantopus himantopus — Stilt

151. Rostratula benghalensis — Painted Snipe

1 f. coll. Savuti, April 15, 1967; 1 m. 1 f. coll. Goha pan, April 18, 1967.

155. Rhinoptilus cinotus — Seebohm's Courser

157. Glareola pratencola — Pratincole

1 f. coll. Savuti, April 12, 1967; gives marked extension of range in Botswana.

158. G. nuchalis — White-collared Pratincole

159. Larus cirrocephalus — Grey-headed Gull

160. L. fuscus — Lesser Black-backed Gull

161. Rynchops flavirostris — African Skimmer

165. Chlidonias leucoptera — White-winged Black Turn
1 f. coll. Kasane, May 22, 1967.

166. Pterocles namaqua — Namaqua Sandgrouse

167. P. burchelli — Spotted Sandgrouse

168. P. gutturalis — Yellow-throated Sandgrouse

169. P. bicinctus — Double-banded Sandgrouse

170. Turnix sylvatica — Button Quail
1 m. 1 f. coll. Kasane, March/May, 1967.

172. Streptopelia semitorquata — Red-eyed Turtle Dove

173. S. dicipiens — Mourning Dove

174. S. capicola — Ring-necked Dove
2 f. coll. Kwikampa pan, March 18, 1967.

175. S. senegalensis — Laughing Dove
1 f. coll. Kasane, April 27, 1967.

176. Oena capensis — Namaqua Dove

177. Turtur chalcospilos — Emerald-spotted Wood Dove
2 m. 1 f. coll. Kasane, March and May, 1967.

178. Treron Australis — Green Pigeon
1 f. coll. Kasane, May 20, 1967.

179. Poicephalus meyeri — Meyer's Parrot
1 m. coll. Kasane, May 9, 1967.

181. Tauraco corythaix — Green Lourie

182. Crinifer concolor — Go-away Bird
2 m. coll. Kasane, March 4 and 22, 1967. Occupied nest Kasane, July 1966.

184. Clamator jacobinus — Jacobin Cuckoo

185. C. levaillantii — Levaillant's Cuckoo

1 specimen coll. Kasane, Jan. 5, 1966; 1 m. 1 f. coll. Kasane, March 6 and April 28, 1967.

187. Cuculus olamosus — Black Cuckoo

189. Chrysococcyx caprius — Diederic Cuckoo

191. Centropus cupricandus — Coppery-tailed Coucal

2 f. coll. Lake Liambezi (Kachikau Enclave), March 8, 1967; 1 m. coll. Kasane, May 1, 1967.

192. C. Seuegalensis — Fleck's Coucal

1 m. coll. Kasane, Dec. 12, 1965.

193. C. superciliosus — White-browed Coucal

1 f. coll. Kasane, May 10, 1967.

194. Tyto alba — Barn Owl

1 m. coll. Kasane, Feb. 18, 1967. Nesting in Hamekop's nest c/7 eggs, July 9, 1967.

195. Asio capensis — Marsh Owl

Common Central Mababe grassland where 35 flushed in 150 yards in October 1966.

196. Otus scopus — Scopus Owl

1 m. coll. Kwikampa Area in mopane in tall grassland, March 19, 1967. Also common in mopane along stock route, April 1, 1967.

198. Bubo africanus — Spotted Eagle-Owl

199. B. lacteus — Verreaux's Eagle-Owl

5 occupied nests along Chobe between Kasane and Simwanza (all old Fish Eagle nests) 3 had chicks up to about 2 weeks old; July 6 to 9, 1966. 6th nest with young Sept. 30, 1966.

200. Scotopelia peli — Fishing Owl

Visually recorded near Kasane.

201. Glaucidium perlatum — Pearl-spotted Owlet

202. G. capense

1 m. coll. Kwikampa area, March 16, 1967.

203. Ciccaba woodfordii — Wood Owl

205. Caprimulgus pectoralis — Fiery-necked Nightjar

1 m. coll. Kasane, Dec. 2, 1965; 1 f. coll. Kasane, May 26, 1967.

206. C. rufigena — Rufus-cheeked Nightjar

1 m. coll. Kwikampa pan, March 16, 1967; 1 m. 1 f. coll. Goha pan, April 18 and 27, 1967. Gives marked extension of range in Botswana.

207. C. natalensis — Natal Nightjar

209. C. fossii — Mocambique Nightjar

210. Cosmetornis vexillarius — Pennant-wing Nightjar

1 f. coll. Kasane, Dec. 1965.

213. Apus horus — Horus Swift

214. Cypsiurus parvus — Palm Swift

465. Chaetura boehmi — Boehm's Spinetail

216. Colius indicus — Red-faced Mousebird

217. Apaloderma narina — Narina Trogon

1 m. coll. Kasane, March 2, 1967.

218. Ceryle maxima — Giant Kingfisher

Excavating nests holes Kasane, July 9, 1966.

219. C. rudis — Pied Kingfisher

2 m. coll. Kasane, April 25 and May 11, 1967; 3 nests c/6 2 nests c/5, 1 nest 5½-grown chicks, 1 nest 4½-grown chicks, Kasane, July 7, 1967; one nest c/6 and c/5 and two with fully fledged chicks in colony at Serondela, July 8, 1967.

220. Alcedo althis — Half-collared Kingfisher

221. Alcedo cristata — Malachite Kingfisher

2 m. 1 f. coll. Kasane, May 22 and 23, 1967. 3 nests with one fresh egg, 4 very small chicks, 4 larger chicks and other nests being excavated early July 1966.

222. Halcyon cyanoleuca — Red- and Black-billed Kingfisher

1 f. coll. Savuti, April 11, 1967. Gives extension of range into area made suitable by flooding of Savuti Channel.

223. H. chelicuti — Striped Kingfisher

1 m. coll. Kwikampa pan, March 20, 1967; 2 m. coll. Kasane, May 9 and 11; 1 m. 1 f. coll. Nanyanga, May 31.

224. H. albiventris — Brown-hooded Kingfisher

1 specimen, sex undetermined, coll. Kasane, May 3, 1966; 1 m. 1 f. coll. Kasane, April 28 and May 11, 1967.

225. H. leucocephala — Grey-hooded Kingfisher

1 f. 1 m. coll. Kwikampa pan, March 16 and 20, 1967; giving considerable eastern extension of species range in Botswana.

226. Merops apiaster — European Bee-eater

1 f. coll. Kasane, Dec. 30, 1965; 1 m. coll. Kwikampa area, March 17, 1967; later record of this migrant than those mentioned by Smithers (1964).

228. M. nubicus — Carmine Bee-eater

229. M. pusillus — Little Bee-eater

2 m. coll. Kwikampa area, March 16, 1967; 1 m. 1 f. coll. Kasane, May 1, 1967.

230. M. bulocki — White-fronted Bee-eater

1 specimen, sex undetermined, from Kasane, Dec. 1965; 2 m. coll. Kasane, May 4, 1967; excavating nests Kasane, July 9, 1966.

231. Dicrocerus hirundineus — Swallow-tailed Bee-eater

1 f. coll. Kasane, May 1, 1967.

232. Coracias garrulus — European Roller

233. C. candatus — Mzilikazi Roller

1 f. coll. Savuti, April 15, 1967; 2 m. coll. Kasane, May 23 and 26, 1967.

‡ C. spatulata — Spatulate Roller

1 f. coll. Kasane, March 29, 1967.

235. Eurystomus glaucurus — Broad-billed Roller

Common along Chobe R. Dec. to Feb.

236. Upupa epops — Hoopoe

237. Phoeniculus purpureus — Red-billed Wood-Hoopoe

2 m. coll. Kasane, April 28, 1967.

238. Rhinopomastus cyanomelas — Scimitar-bill

1 m. coll. Kasane, April 21, 1967.

239. Tockus nasutus — Grey Hornbill

1 m. coll. Kwikampa area, March 20, 1967; 2 f. coll. Kasane, May 5 and 24, 1967.

240. T. erythrorhynchus — Red-billed Hornbill

1 m. coll. Kwikampa area, March 19, 1967; 2 m. coll. Kasane, March 29 and April 28, 1967.

241. T. flavirostris . — Yellow-billed Hornbill

242. T. bradfieldi — Bradfield's Hornbill

243. Bycanistes bucinator — Trumpeter Hornbill

244. Bucorvus leadbeateri — Ground Hornbill

245. Lybius torquatus — Black-collared Barbet

1 m. 1 f. coll. Kasane, March 7, 1967.

246. L. leucomelas — Pied Barbet

247. Pogoniulus chrysoconus — Yellow-fronted Tinkerbird

1 f. coll. Kasane, March 24, 1967.

248. Trachyphonus vaillantii — Crested Barbet

1 f. and 1 unsexed specimen coll. Kasane, March 28 and 30, 1967. Confirms Smithers' (1964) suggestion that this species would be found in N.E. Botswana.

249. Indicator indicator — Greater Honeyguide

1 specimen, sex undetermined, from Kasane, Nov. 27, 1966; 2 f. coll. Kasane, May 22 and 25, 1967.

250. I. minor — Lesser Honeyguide

2 f. coll. Kasane, March 30 and April 24, 1967.

251. Prodotiscus regulus — Wahlberg's Honeyguide

252. Thripias namaquus — Bearded Woodpecker

2 f. 1 m. coll. Kasane, March and May, 1967.

253. Dendropicos fuscescens — Cardinal Woodpecker

1 m. coll. Kwikampa pan March 16, 1967; 1 f. coll. Kasane April 29, 1967. Identified by Irwin as D. f. capriviensis

255. Campethera abingoni — Golden-tailed Woodpecker

The presence of this widespread species within the Chobe Game Reserve, needs confirmation.

256. Mirafra javanica — White-tailed Bush-Lark

1 f. coll. Kasane, May 9, 1967. Gives marked extension of species range in Botswana.

258. M. africana — Rufus-necked Lark

2 m. coll. Satau and Lake Liambezi (Kachikau Enclave) March 9 and 10, 1967; 1 f. from Goha pan, April 17, and 1 m. from Kasane, April 25, 1967.

261. M. rufeeinnamomea — Flappet Lark

1 m. coll. Kwikampa area, March 20, 1967 with 1 f. from Kasane, May 2, 1967. Identified by Irwin as M.R. mababiensis Gives marked N.E. extension of species range and confirms Smithers' (1964) suggestion that this race would be found in far N.E. corner of Botswana.

262. M. africanoides — Fawn-coloured Lark

This species may occur in the Chobe Game Reserve, but its presence needs confirmation.

266. Calandrella cinerea — Red-capped Lark

1 f. coll. Savuti, April 14, 1967. Identified as c.c. anderssoni by Irwin and although Smithers (1964) is not quite clear on the distribution of the species in Botswana, this appears to represent a marked extension of its range.

273. Riparia paludicola — African Sand Martin

1 m. coll. Kasane, May 24. Several nests at Kasane on July 7, 1966 ranged from new excavations to one with c/4 fresh eggs and 3 with c/3 well incubated eggs.

274. Hirundo rustica — European Swallow

1 specimen from Kasane, Dec. 1965.

275. H. smithii — Wire-tailed Swallow

280/1. H. cucullata and H. abyssinica — Larger Striped Swallow and Lesser Striped Swallow

The possible occurrence of both these species in the Chobe Game Reserve needs checking.

282. H. griseopyga — Grey-rumped Swallow

Pair collecting nesting materials Serondela, July 8, 1966.

288. Motacilla capensis — Cape Wagtail

1 m. 1 f. coll. Serondela, May 27, 1967.

289. Motacilla alba — Pied Wagtail

290. Anthus novaeseelandiae — Richards' Pipit

1 m. coll. Satau (Kachikau Enclave) March 10, 1967; 1 m. 1 f. coll. Savuti, April 13 and 14, 1967. Race given as A.n. rufuloides by Irwin.

291. A. leucophrys — Plain-backed Pipit

1 f. coll. Satau (Kachikau Enclave), March 10, 1967.

292. A. vaalensis — Pale Plain-backed Pipit

297. Macronyx ameliae — Pink-throated Longclaw

1 m. coll. Satau (Kachikau Enclave), March 10, 1967.

298. Eurocephalus anguitimens — White-crowned Wood Shrike

1 m. 1 f. coll. in mopane woodland Kwikampa area, March 19, 1967.

299. Prionops plumata — Helmet Shrike

1 f. 2 m. coll. Kasane, May 5 to 20, 1967.

300. P. retzii — Red-billed Helmet Shrike

1 m. 1 f. coll. Kasane, April 21, 1967.

301. Hilaus afer — Brubru

1 m. coll. Kasane, May 26, 1967.

302. Dryoscopus cubla — Puff-back Shrike

1 m. coll. Kasane, March 6, 1967, and 1 m. from Kwikampa March 17, 1967.

303. Tchagra australis — Three-streaked Redwing-Shrike

2 m. 1 f. coll. Kasane, April 21 and May 26, 1967.

304. T. senegala — Black-crowned Tchagra

1 m. 1 f. coll. Kwikamps area, March 19, 1967.

305. Laniarius aethiopicus — Boubou Shrike

2 m. coll. Kasane, March 2 and 3, 1967.

306. L. bicolor — Swamp Boubou Shrike

307. L. atro-coccineus — Crimson breasted Shrike

308. Malaconotus sulphureopectus — Sulphur-breasted Bush Shrike

2 m. coll. Kasane, March 3 and 6, 1967.

309. M. blanchoti — Grey-headed Bush Shrike

2 m. coll. Kasane, March 28 and 29, 1967. Confirms extension of range expected by Smithers (1964).

310. Lanius melanoleucus — Magpie-Shrike

1 m. coll. Savuti, April 15, 1967.

311. L. cristatus — Red-backed Shrike

315. Oriolus auratus — African golden oriol

1 f. 1 m. coll. Kwikampa, March 17 and 18; 1967; 1 m. from Goha pan, April 16, 1967, gives extension of known range.

316. O. lavatus — Black-headed Oriol

317. Dicrurus adsimilis — Fork-tailed Drongo

2 m. coll. Kasane, April 27 and May 1, 1967.

319. Lamprotornis chalybaeus — Greater Blue-eared Glossy Starling

3 m. coll. Kasane/Serondela, May 22 and 27, 1967.

321. L. australis — Greater Glossy Starling

1 m. coll. Goha pan, April 17, 1967.

322. L. mevesii — Long-tailed Starling

323. Cinnyricinclus leucogaster — Violet-backed Starling

324. Creatophora cinerea — Wattled Starling

325. Buphagus africanus — Yellow-billed Oxpecker

326. B. erythrorhynchus — Red-billed Oxpecker

329. Coracina pectoralis — White-breasted Cuckoo-Shrike

330. Campephaga phoenicea — Black Cuckoo-Shrike

1 m. coll. Kwikampa pan, March 17, 1967; and 1 m. from Kasane, March 28, 1967.

331. Pycnonotus barbatus — Layard's Bulbul

1 m. 1 f. coll. Kasane, March 2, 1967.

332. P. nigricans — Red-eyed Bulbul

Status in Chobe Game Reserve requires checking.

333. Chloricichla flaviventris — Yellow-bellied Bulbul

2 m. coll. Kasane, April 21 and 28, 1967.

334. Phyllastrephus terrestris — Terrestrial Bulbul

1 f. coll. Kasane, Aug. 5, 1966; 1 m. 1 f. coll. Kasane March 2, 1967.

335. Saxicola torquata — Stone chat

2 m. coll. Lake Liambezi/Satau (Kachikau Enclave), March 9 and 10, 1967; 2 m. from Kasane, May 1, 1967.

336. Oenanthe pileata — Capped Wheatear

Possible occurrence in Chobe Game Reserve need confirmation.

339. Thamnolaea arnotti — Arnott's Chat

1 m. 1 specimen, sex undetermined, coll. Ngwezumba bridge, March 18, 1967.

345. Erythropygia leucophrys — Scrub Robin

2 m. coll. Kasane, April 24 and May 22, 1967.

347. E. quadrivirgata — Bearded Scrub Robin

1 m. 1 f. coll. Kasane, March 28 and 4, 1967.

348. Cossypha heuglini — Heuglin's Robin

2 f. coll. Kasane, March 3, 1967.

349. Luscinia luscinia — Thrush Nightingale

2 m. coll. Kasane, March 5, 1967, gives marked extension of known range in Botswana of this Palaearctic migrant.

350. Turdus libonyanus — Kurrichane Thrush

1 f. coll. Kasane, April 26, 1966; 1 m. coll. Kasane, May 26, 1967.

351. T. litsitsirupa — Ground-scraper Thrush

352. Turdoides jardinei — Jardine's Babbler

1 m. coll. Kasane, March 3, 1967.

354. T. bicolor — Pied Babbler

2 m. coll. Savuti, April 12, 1967. Gives marked extension of range in Botswana.

377. S. communis — Whitethroat

1 m. 1 f. coll. Ngwezumba bridge, March 18, 1967; 1 f. from Kasane, March 30, 1967. Like 376,a marked extension of range in Botswana of a Palaeartic migrant.

378. Phylloscopus trochilus — Willow Warbler

1 m. 1 f. coll. Kwikampa pan, March 15 and 17, 1967. Identified as P.t. acredula by Irwin, which gives a marked extension of range for this subspecies of Palaearctic migrant.

379. Cisticola erythrops — Red-faced Cisticola

381. C. chiniana — Rattling Cisticola

1 m. coll. Serondela, May 27, 1967.

382. C. rufilata — Tinkling Cisticola

1 m. 1 f. coll. Goha pan, April 17, 1967.

383. C. galectotes — Winding Cisticola

1 m. 1 f. coll. Lake Liambezi (Kachikau Enclave) March 9, 1967; 3 m. from Kasane and 2 f. from Serondela, April 25, to May 27, 1967.

384. C. pipiens — Chirping Cisticola

385. C. natalensis — Croaking Cisticola

Recorded near Panda-ma-Tenga (Smithers, 1964) and should be sought in similar long-grassland habitat on the Kakulwani plain in the east of the Chobe Game Reserve.

386. C. fulvicapilla — Neddicky Cisticola

387. C. juncidis — Fan-tailed Cisticola

1 f. coll. Satau (Kachikau Enclave), March 10, 1967.

391. Prinia subflava — Tawny-flanked Prinia

1 m. coll. Lake Liambezi (Kachikau Enclave), March 8, 1967; 1 m. from Goha pan, April 18, 1967.

393. Apalis flavida — Black-breasted Apalis

394. Camaroptera brevicandata — Grey-backed Camaroptera

2 m. coll. Kasane, March 22 and 30, 1967. Nest with 3 freshly hatched young 12 miles s. of Jovorega, April 6, 1967.

396. C. stierlingi — Stierling's Barred Warbler

397. Eremomela icteropygialis — Yellow-bellied Eremomela

1 m. 1 f. coll. Kasane, May 26, 1967, and identified by Irwin as E.i. viriditincta

399. E. usticollis — Burnt-necked Eremomela

400. Sylvietta rufescens — Long-billed Crombec

1 f. coll. Kwikampa area, March 15, 1967; 1 m. coll. Kasane, May 26, 1967.

401. Parisoma subcaeruleum — Tit-Babbler

403. Parus niger — Black Tit

2 f. coll. Kasane, March 6 and 7, 1967.

405. Anthoscopus caroli — Penduline Tit

Unoccupied nest W. Mababe.

406. Anthreptes collaris — Collared Sunbird

407. Nectarinia amethystina — Black Sunbird

1 m. 1 f. coll. Kasane, March 24 and May 3, 1967; 1 m. from Kwikampa pan March 20, 1967; 1 f. from Lake Liambezi (Kachikau Enclave), March 24, 1967; 1 f. from Savuti, April 12, 1967. Gives marked extension of range and shows general distribution of this species in northeastern Botswana.

408. N. senegalensis — Scarlet-chested Sunbird

1 m. coll. Kwikampa pan, March 17, 1967.

409. N. talatala — White-bellied Sunbird

1 m. 1 f. coll. Kasane, March 28 and May 9, 1967; 1 f. from Savuti, April 12, 1967.

412. Nectarinia mariquensis — Marico Sunbird

2 m. coll. Kasane, April 24 and May 3, 1967; 1 m. from Savuti, April 12, 1967.

414. Zosterops senegalensis — Yellow White-eye

2 f. coll. Kasane, May 24, 1967.

416. Amblyospiza albifrons — Thick-billed Weaver

417. Ploceus xanthopus — Holub's Golden Weaver

2 m. coll. Kasane, Dec. 14, 1965, and March 13, 1967.

418. P. xanthopterus — Brown-throated Golden Weaver

1 f. coll. Kasane, Sept. 1, 1966; 1 f. coll. Kasane, March 13, 1967; 1 m. from Goha pan, April 17, 1967. Latter = extension of range into dry part of Game Reserve where reed beds are absent, cf. Smithers(1964) who describes the species habitat as Phragmites reed beds in swamp or along rivers.

419. P. intermedius — Lesser Masked Weaver

The presence of this species in the Chobe Game Reserve needs further investigation.

420. P. velatus — Masked Weaver

1 f. 1 m. coll. Kasane, April 21 and May 26, 1967.

421. P. cuculatus — Black-headed Weaver

1 m. coll. Lake Liambezi (Kachikau Enclave), March 9, 1967. The habitat here is open grassland, subject to seasonal inundation, with scattered big trees on termitaria and not woodland as Smithers (1964) suggests as this species habitat.

422. P. ocularis — Spectacled Weaver

423. Anaplectes melanotis — Red-headed Weaver

424. Quelea quelea — Red-billed Quelea

1 m. coll. Kwikampa pan, March 16, 1967; 1 m. 1 f. Kasane, March 28 and May 1, 1967.

425. Euplectes orix — Red Bishop

428. E. axillaris — Red-shouldered Widow Bird

429. Anomalospiza imberbis — Cuckoo-Weaver

Recorded on Gazuma pan by Smithers (1964) and may therefore extend into the Chobe Game Reserve in similar habitat along the Kakulwani plain.

430. Bubalornis albirostris — Buffalo Weaver

1 m. 1 f. coll. Savuti, April 12 and 11, 1967; 1 f. from Kasane, May 26, 1967.

436. Passer diffusus — Grey-headed Sparrow

437. Petronia superciliaris — Yellow-throated Sparrow

1 m. 1 f. coll. Kasane, March 29, 1967; 1 m. coll. Savuti, April 14, 1967.

438. Sporopipes squamifrons — Scaly Weaver

The presence of this species in the Chobe Game Reserve needs confirmation.

439. Vidua macroura — Pin-tailed Whydah

1 m. coll. Lake Liambezi (Kachikau Enclave), March 9, 1967.

440. V. regia — Shaft-tailed Whydah

441. V. paradisea — Paradise Whydah

1 m. coll. Kasane, Dec. 14, 1965.

442. V. funerea — Dusky Indigo-Bird

1 m. coll. Kasane, March 28, 1967. This gives significant extension of species range in Botswana.

445. Pytilia melba — Melba Finch

2 m. coll. Kasane, March 13 and 29, 1967; 1 m. Nanyanga, May 31, 1967.

446. Estrilda astrild — Common Waxbill

1 m. 1 f. coll. Kasane, May 20, 1967.

447. E. erythronotos — Black-cheeked Waxbill

Presence of this species in Chobe Game Reserve needs confirmation.

448. Granatina granatina — Violet-eared Waxbill

1 f. coll. Kasane, May 5, 1967; 1 m. coll. Ngwezumba bridge, March 18, 1967.

449. Uraeginthus angolensis — Blue Waxbill

1 f. coll. Nanyanga, May 31, 1967.

450. Lagonosticta senegala — Red-billed Fire-Finch

1 f. 1 m. coll. Kasane, March 28 and May 9, 1967.

452. L. jamesoni — Jameson's Fire-Finch

1 f. coll. Kasane, May 4, 1967.

454. Ortygospiza atricollis — Quail-Finch

455. Emberiza flaviventris — Golden-breasted Bunting

1 f. coll. Goha pan, April 17, 1967; 2 f. coll Kasane, May 1 and 26, 1967.

456. Fringillaria tahapisi

2 f. coll. Kasane, April 21, 1967; gives marked extension of range in Botswana.

459. Serinus mazambicus — Mocambique Canary

1 m. coll. Kasane, March 4, 1967.

460. S. atrogularis — Black-throated Canary

1 m. coll. Kasane, March 30, 1967.

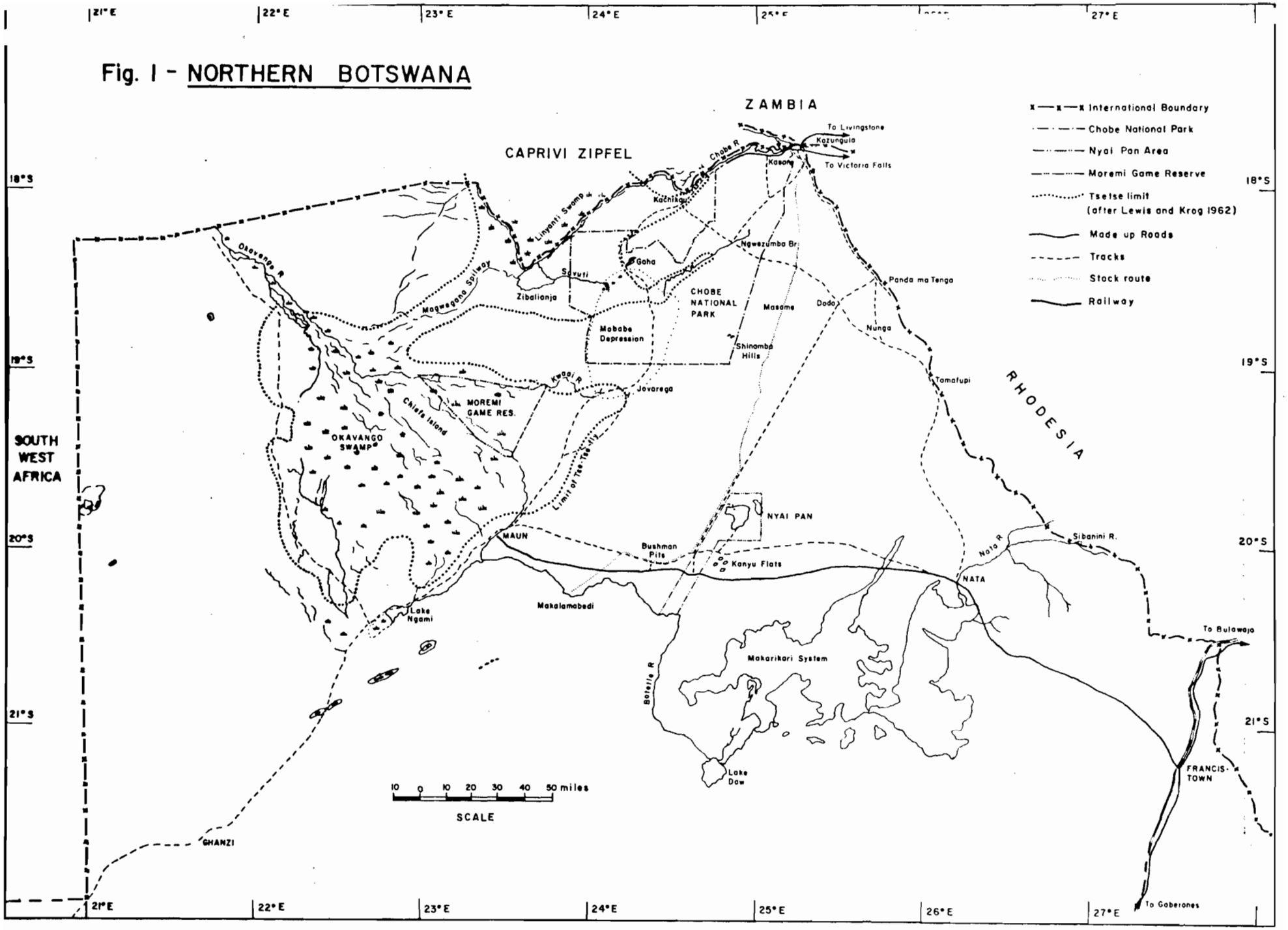


Fig. I - NORTHERN BOTSWANA
ZAMBIA
CAPRIVI ZIPFEL
RHODESIA
SOUTH WEST AFRICA
International Boundary
Chobe National Park
Nyai Pan Area
Moremi Game Reserve
Tsetse limit (after Lewis and Krog 1962)
Made up Roads
Tracks
Stock route
Railway
To Livingstone
Kazungula
To Victoria Falls
Kasane
Chobe R
Kachikau
Linyanti Swamp
Ngwezumba Br
Goha
Savuti
Zibalianja
Magwegana Spillway
Okavango R
CHOBE NATIONAL PARK
Masame
Dodoi
Panda ma Tenga
Nunga
Mababe Depression
Shinamba Hills
Tamafupi
Jovarega
Kwai R
MOREMI GAME RES.
Chiefs Island
OKAVANGO SWAMP
Limit of Tse Tse fly
NYAI PAN
MAUN
Bushman Pits
Kanyu Flats
Nata R
NATA
Sibanini R.
Makalamabedi
Lake Ngami
To Bulawayo
Makarikari System
Boteti R
Lake Dow
FRANCIS-TOWN
To Gaberones
GHANZI
10 0 10 20 30 40 50 miles
SCALE
18°S
19°S
20°S
21°S
21°E
22°E
23°E
24°E
25°E
26°E
27°E

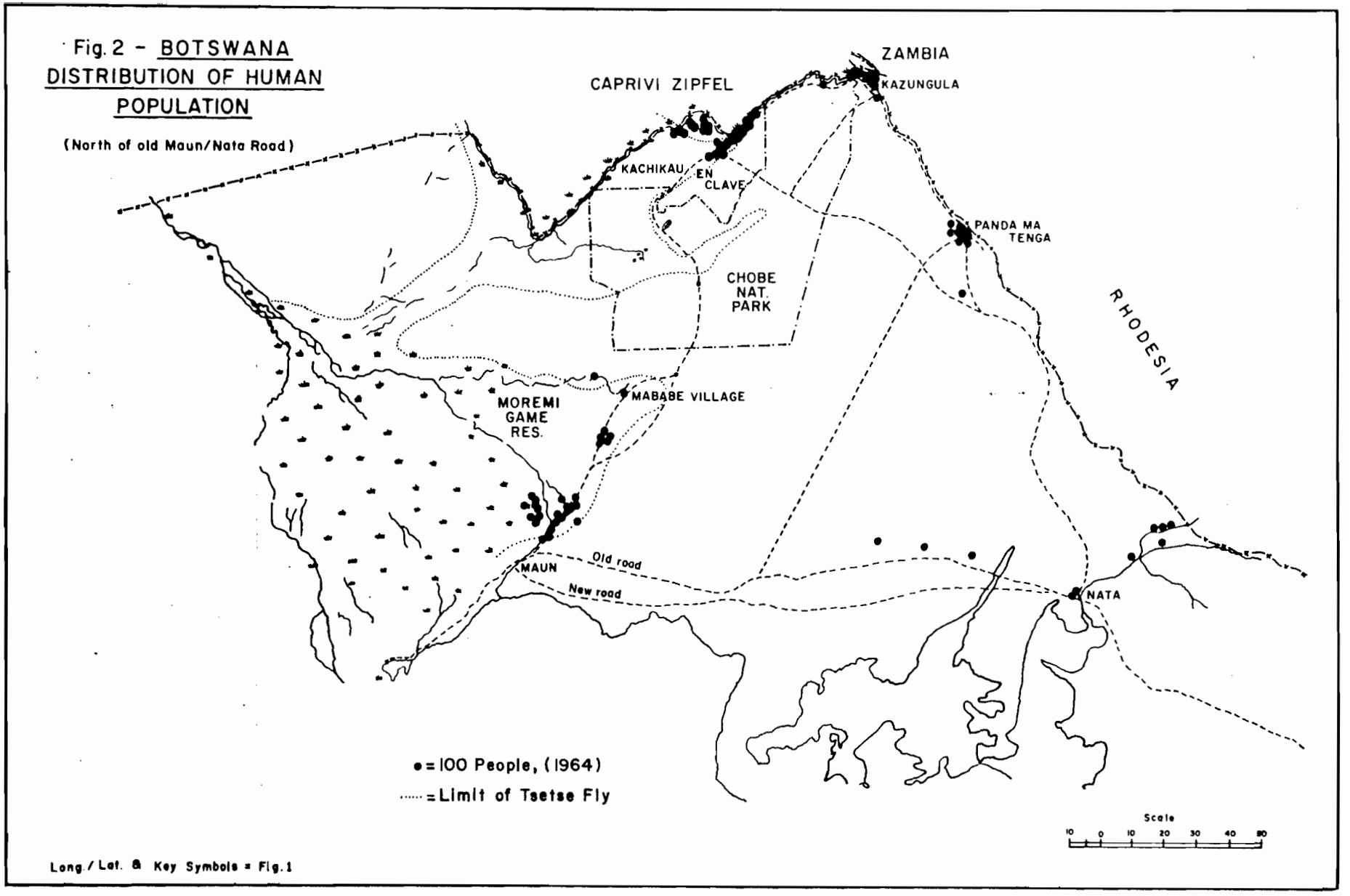


Fig. 2 - BOTSWANA
DISTRIBUTION OF HUMAN POPULATION
(North of old Maun/Nata Road)
ZAMBIA
CAPRIVI ZIPFEL
KAZUNGULA
KACHIKAU EN CLAVE
PANDA MA TENGA
CHOBE NAT. PARK
RHODESIA
MOREMI GAME RES.
MABABE VILLAGE
MAUN
Old road
New road
NATA
●= 100 People, (1964)
.....= Limit of Tsetse Fly
Scale
10 0 10 20 30 40 80
Long./Lat. & Key Symbols = Fig. 1

Fig. 3 - WILDLIFE AREAS IN NORTHERN BOTSWANA

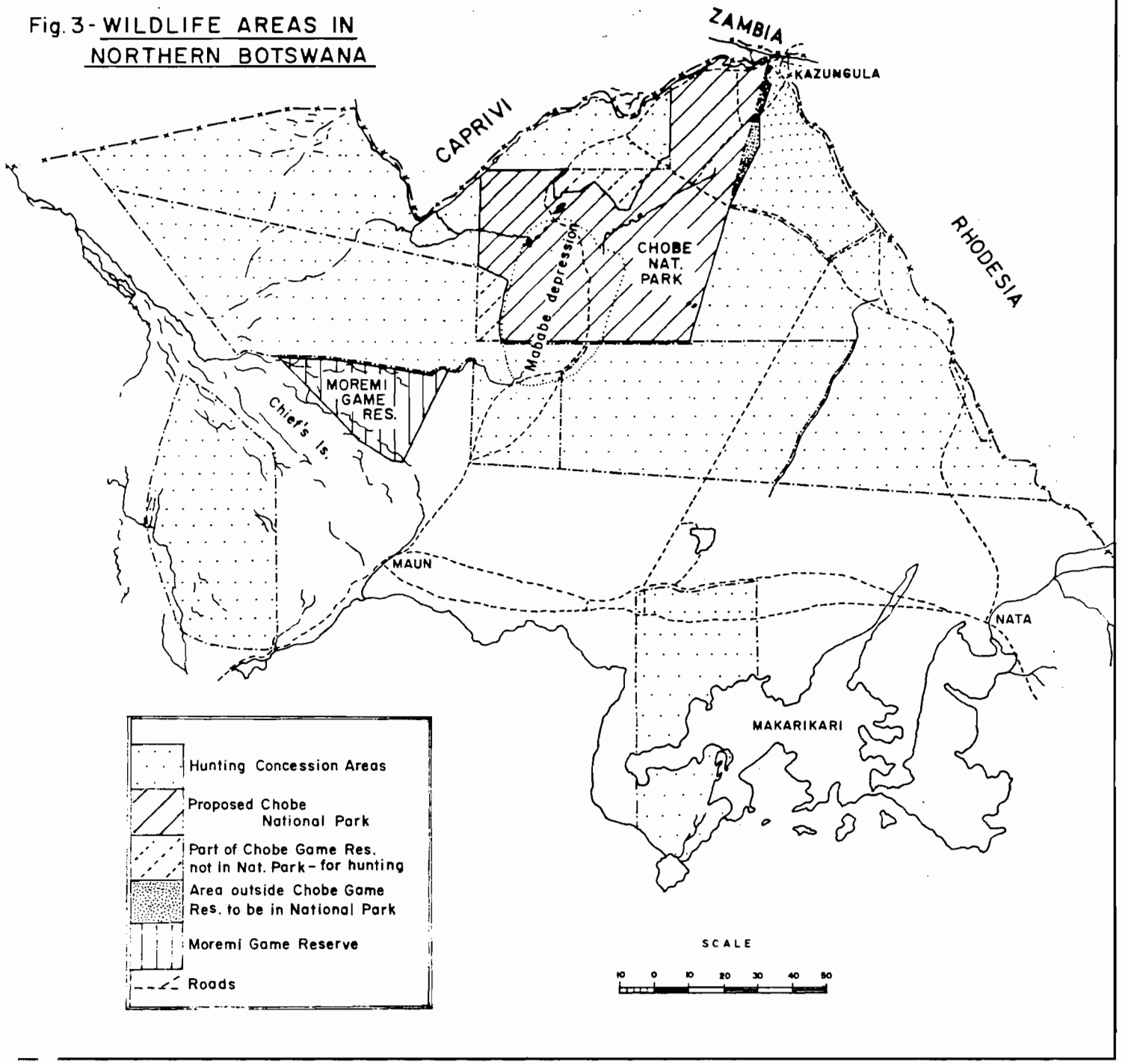
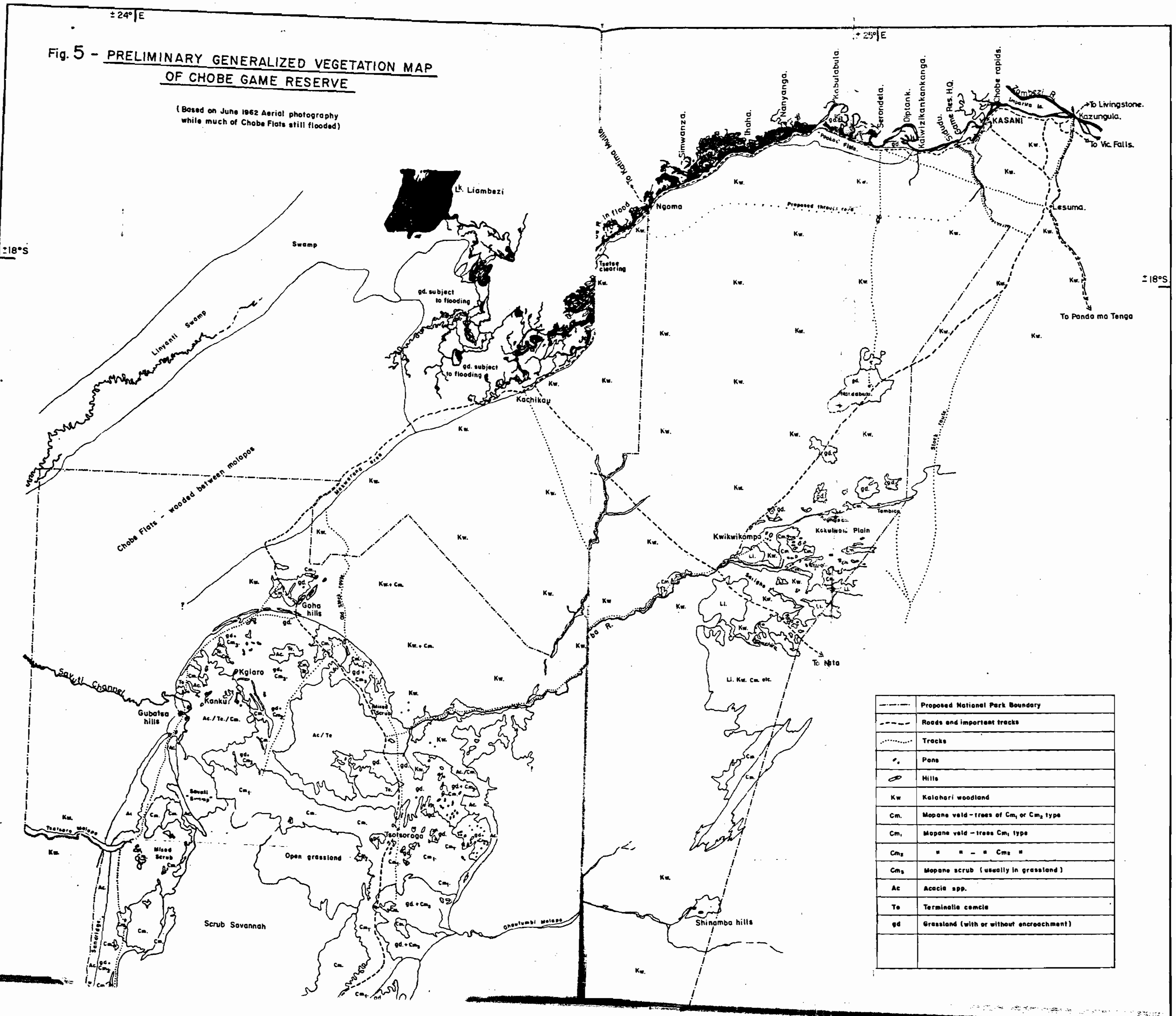


Fig. 5 - PRELIMINARY GENERALIZED VEGETATION MAP OF CHOBE GAME RESERVE

(Based on June 1962 Aerial photography while much of Chobe Flats still flooded)



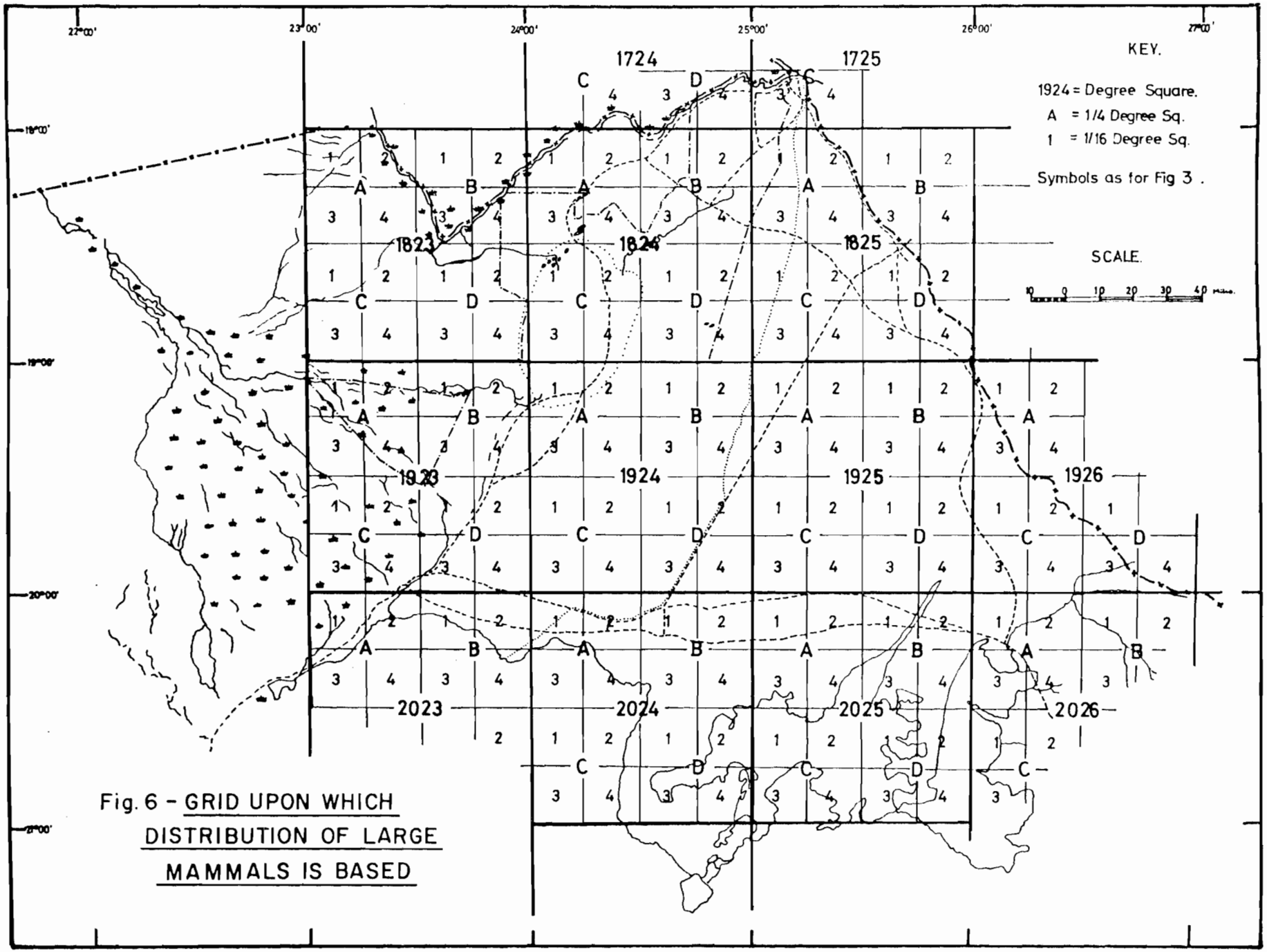


Fig. 6 - GRID UPON WHICH DISTRIBUTION OF LARGE MAMMALS IS BASED

FIG. 7 - ELEPHANT AND BUFFALO ALONG THE CHOBE RIVER

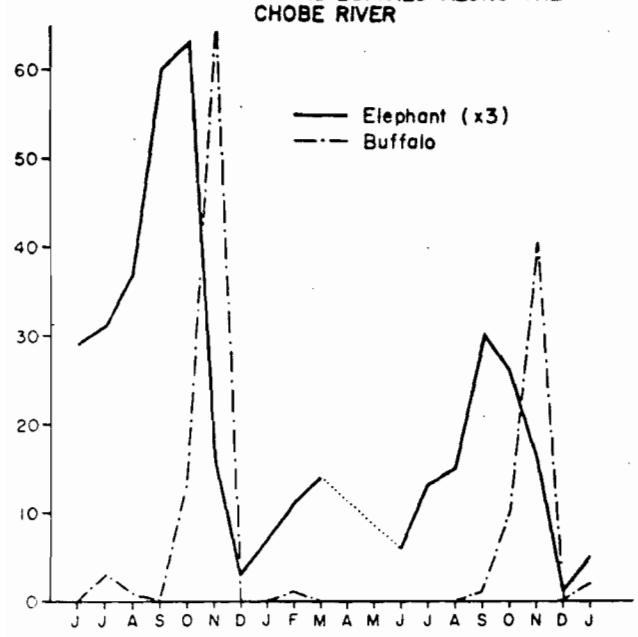


FIG. 9 - WARTHOG AND IMPALA ALONG THE CHOBE RIVER

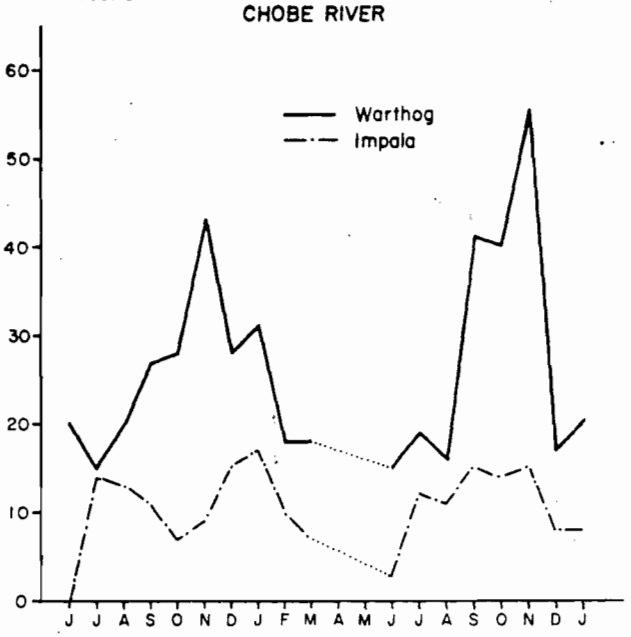


FIG. 10 - LECHWE PUKU AND WATERBUCK ALONG THE CHOBE RIVER

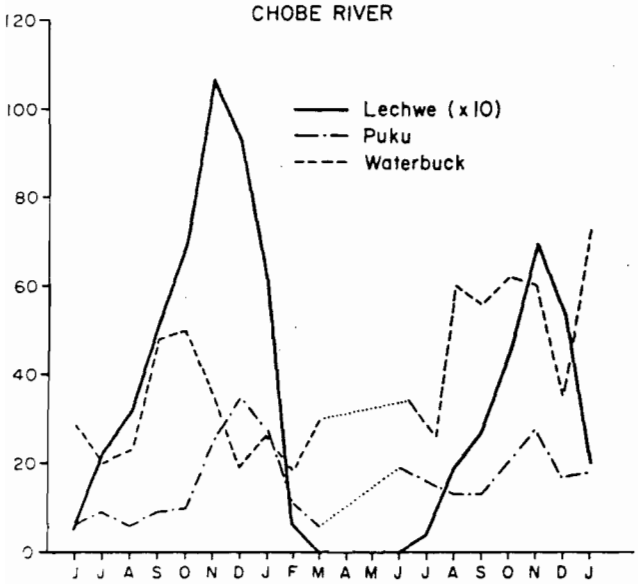


FIG. 11 - SABLE AND ROAN ANTELOPE ALONG THE CHOBE RIVER

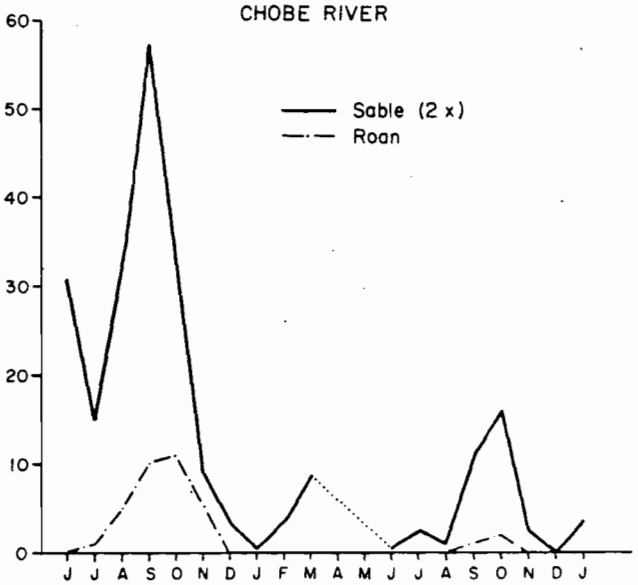


FIG 12 - WILDEBEEST AND TSESSEBE ALONG THE CHOBE RIVER

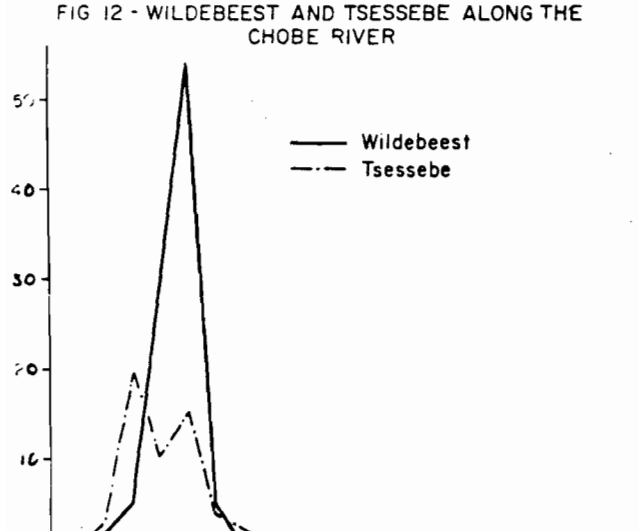


FIG. 13 - KUDU AND BUSHBUCK ALONG THE CHOBE RIVER

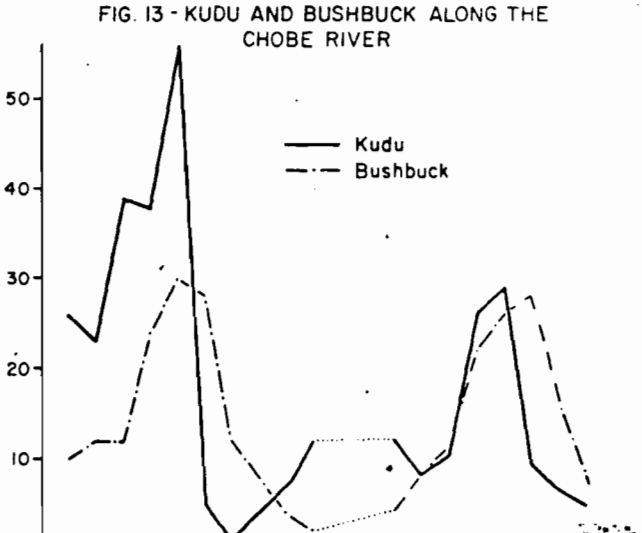
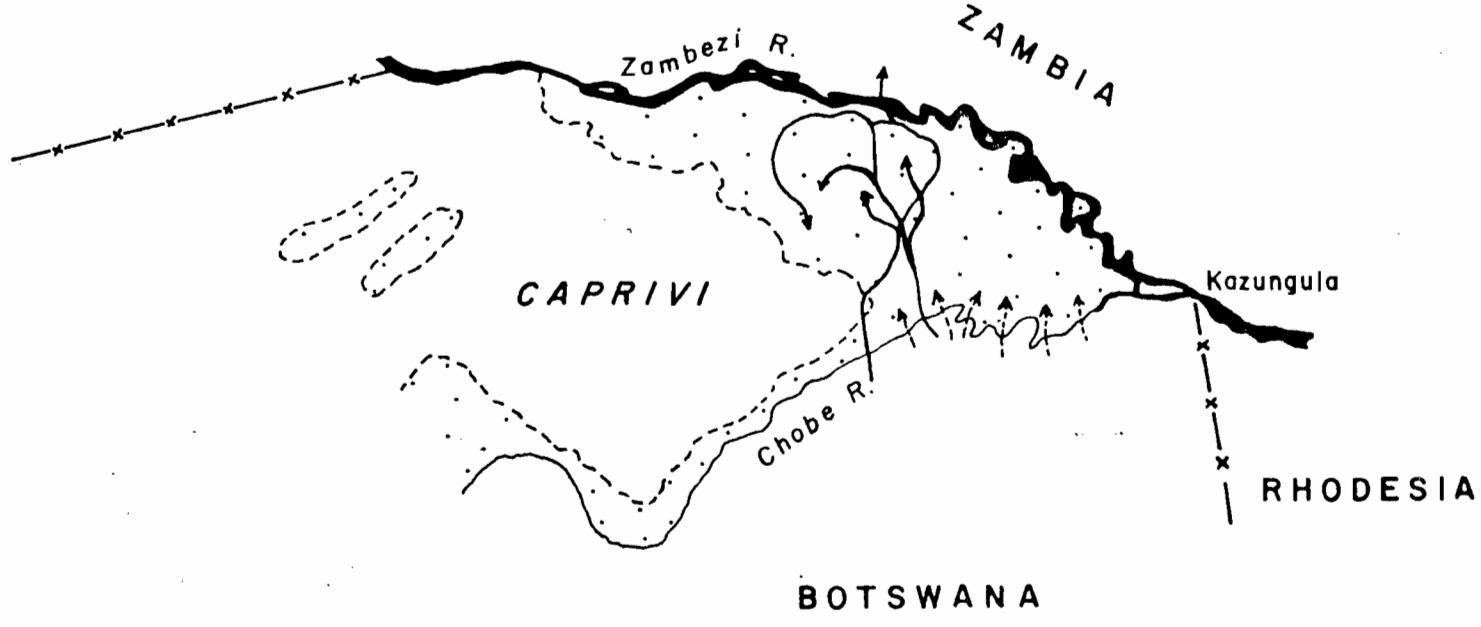


Fig. 8 – MOVEMENTS OF ELEPHANTS FROM BOTSWANA INTO THE EASTERN CAPRIVI



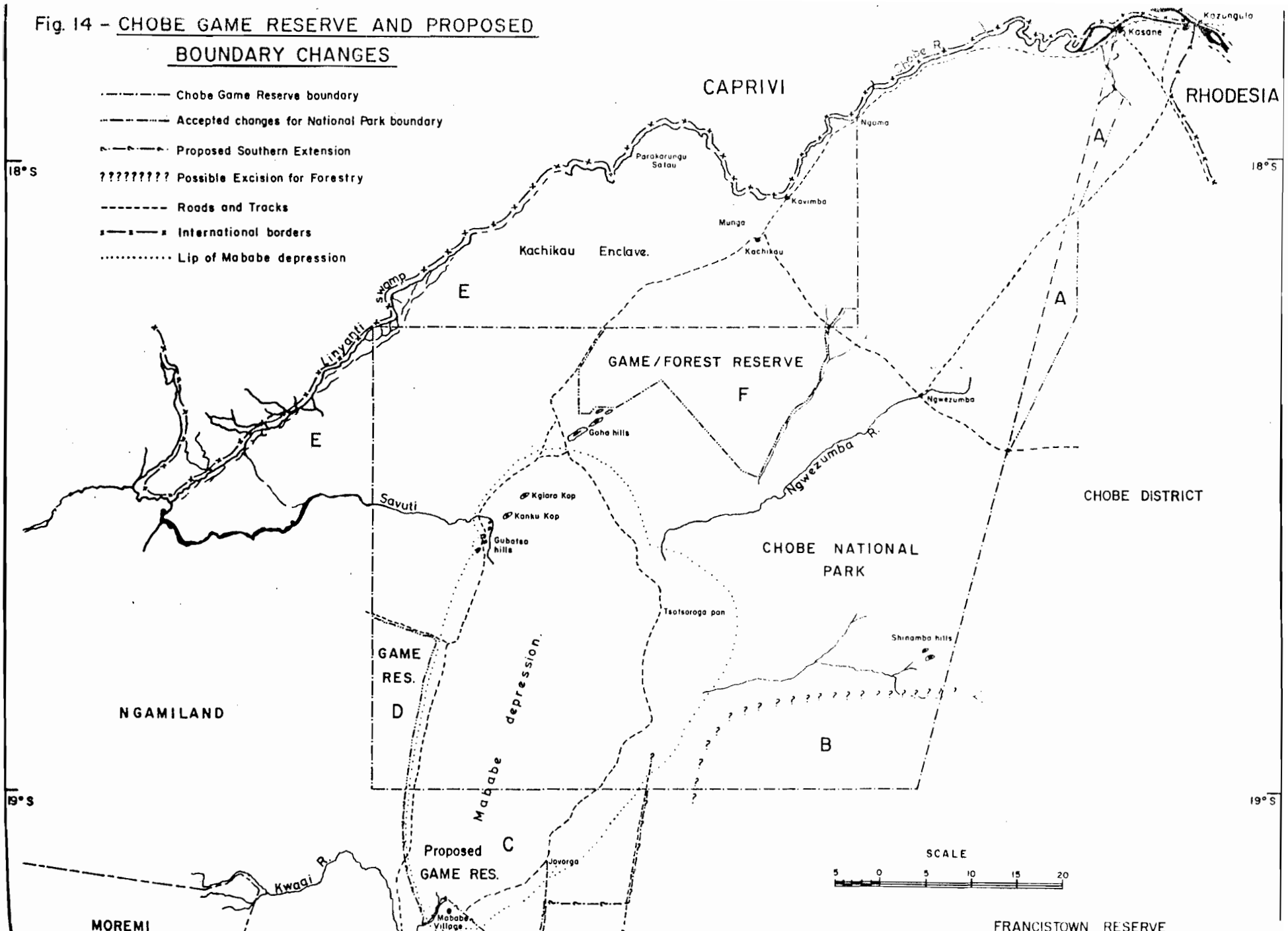


Fig. 14 - CHOBE GAME RESERVE AND PROPOSED BOUNDARY CHANGES
Chobe Game Reserve boundary
Accepted changes for National Park boundary
Proposed Southern Extension
Possible Excision for Forestry
Roads and Tracks
International borders
Lip of Mababe depression
CAPRIVI
RHODESIA
Kazungula
Kasane
Chobe R.
Ngoma
Parakarungu Satau
Kavimba
Munga
Kachikau
Kachikau Enclave.
swamp
Linyanti
E
A
GAME/FOREST RESERVE
F
Ngwezumba
Goha hills
Ngwezumba R.
CHOBE DISTRICT
Savuti
Kgiara Kop
Kanku Kop
Gubatsa hills
CHOBE NATIONAL PARK
Tsotsoroga pan
Shinamba hills
GAME RES.
D
NGAMILAND
Mababe depression
B
Proposed GAME RES.
C
Jovorga
Kwagi R.
Mababe Village
MOREMI
FRANCISTOWN RESERVE
SCALE
5 0 5 10 15 20
18°S
19°S