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EAST AFRICAN WILD LIFE
SOCIETY'S REPRESENTATIVE

J. F. Lipscomb



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COVER
PICTURE



A Jackson's Chameleon by Bill Wilson of Nairobi. Taken with an Asahi Pentax f1.8 and Kopil Bellowscope, on Ektachrome 32 ASA.

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Society's Page

Serengeti Survey

THE SERENGETI PLAINS of Tanganyika possess the largest remaining assemblage of ungulates in Africa or in all the world.

These animals occupy a region stretching from Lake Victoria in the west to the edge of the Rift Valley in the east (including the Ngorongoro Crater), and from the Eyasi escarpment in the south to the Mara-Loita Plains in the north.

This vast area, comprising some 15,000 square miles, is bounded by topographical features or human settlement which to a large extent restrict the plains animals to it thus forming one great ecological unit.

The Serengeti consists of the central plains of open grassland surrounded by a vast peripheral region of bush and open spaces; the Mara is bush country with large open glades and plains, and the Loita is open grassland.

On the Serengeti wildebeest and zebra—the two most important large plains species—occupy the open grassland plains until these dry out and can no longer provide sufficient food, when they move off into the peripheral bush searching for the freshest grazing.

In 1961 the move took place in May, the herds wandering in varying directions through the bush until grazing is again available on the central plains.

These movements, which vary to some extent from year to year in time and direction, have been the subject of much discussion and argument. Originally many authorities thought that they followed some set and regular pattern, but it is now largely agreed that they are in fact governed by weather conditions which themselves are subject to considerable variation from season to season.

IT has been known for some time that a certain number of wildebeest and zebra move between the Mara and Loita in Kenya and the Serengeti in Tanganyika. It has already been said these three areas form an ecological entity beyond which the plains animals do not move to any appreciable extent. When planning the future of this great wildlife habitat it is obviously important to know with reasonable accuracy how many animals are present.

Several estimates or counts have been made covering parts of the region under discussion, but to obtain a true picture of the wildlife populations in the complete region the latter must be surveyed as a whole. A wildlife survey of this kind can only be undertaken from the air and the size of the region made it appear that the cost of such an operation would be prohibitive. However, early in 1961 two factors developed which made the survey possible.

First, a Royal Air Force photographic reconnaissance Canberra of Bomber Command came to East Africa during May for navigational and photographic training flights. The local R.A.F. commander in East Africa agreed that some of these flights should be made over the Serengeti where the concentrations of wildebeest and zebra would provide the crew with practice in photographing "opportunity targets."

The Joint Air Reconnaissance Intelligence Centre in England also welcomed the opportunity of interpreting the photographs, which provided their staff with an interesting and valuable exercise.

FOR many years, doubts have been expressed as to the wildlife population figures of East Africa.

Now, with the aid of aircraft, exact counts have produced irrefutable facts.

*240,000 Wildebeest;
170,000 Zebra; half a million
Thomson's Gazelle; all these
and many other actual figures
have now been obtained
thanks to man's conquest of
the air.*

*R. A. F. jet bombers, Army
reconnaissance aircraft
and the East African Wild
Life Society's own 'plane
have made this advance
possible, as can be seen from
this account*

by

D. R. M. STEWART

and

LEE M. TALBOT

Then Wilken Air Services, by forgoing a large part of their usual margin of profit, made available a light aircraft for a survey of the whole region. This was financed and carried out by the Wildlife Research Project (an American unit studying the Serengeti and Mara) and the Kenya Game Department's Fauna Research Unit. Tanganyika National Parks supplied fuel for the Serengeti part of the operation.

From the results of these two surveys figures have been obtained for the first time, showing the numbers of wildebeest, zebra and other species in the entire region.

THE Canberra aircrew photographed the concentrations of wildebeest and zebra on 15th May, 1961, after preliminary reconnaissance flights by themselves and by an Army Auster of 8th Independent Air Recce Group. At this time the herds were on the open plains some 15 miles south-south-west of Seronera over an area of some 25 square miles.

Flying at about 4,000 feet, the aircraft made 22 runs taking continuous photographs. The animals were later counted individually by the Joint Air Reconnaissance Intelligence Centre by projecting the film positives using a gridded overlay. A mosaic was then made of the prints, and the overlaps between runs were cut off. The animals on these overlaps were also counted individually, and the total subtracted from the animals counted on the film positives.

A further deduction of 5 per cent was made to allow for overlap between cameras (the average overlap is 3.4 per cent), and in case any other species had been confused with wildebeest or zebra on the photographs. As the aircrew saw very few animals of other species in the area of the wildebeest and zebra concentrations, any error of this kind is likely to have been very slight. The total of wildebeest came to 194,411 and that of zebra to 25,613.

THEN came the light aircraft survey which began on 19th May and lasted until the 31st. The aircraft used were a Piper Tripacer and a Piper Cruiser, with Captain K. Mousley as pilot and the writers as observers. The actual counting, apart from reconnaissance, took 63 flying hours (Loita-Mara 16 hours; Serengeti 47 hours) and the method used was similar to that which has been developed in recent years and used in several parts of East Africa.

THE WILD LIFE SOCIETY'S own aircraft was handed over to Executive Chairman J. F. Lipscomb by J. M. Williams (right) of Wilken Air Services in January.





A map of the area was first divided by grid lines to give numbered squares. Whenever animals were counted the square within which they fell was noted so that distribution maps could subsequently be plotted.

From the air the ground was then divided up into small areas of a few square miles bounded by easily recognisable features, and each of these was flown over on a series of parallel tracks whilst the two observers counted on their respective sides of the aircraft. The tracks are usually 300-800 yards apart, according to the density of the animals and the visibility, so that the observers each count a strip 150-400 yards wide.

As the units counted are small in size an observer can remember by various ground features the limit to which he has counted, so that when the aircraft turns back upon a track in the reverse direction the observer on the side nearest the ground already counted can avoid including any animals a second time.

Herds too large to be counted as the aeroplane flew past were circled and whenever herds too large to be accurately counted by eye were encountered, these were photographed on high-speed Ektachrome and the animals later counted from the projected colour slide.

For ordinary visual counting the aeroplane flies at 400-500 feet; when visibility is exceptionally good or animals are few and far between the altitude and the distance between parallel tracks can be increased.

When experienced pilots and observers are used and the ground is divided into small units to avoid double counting and errors due to drift, the principal source of error in a survey lasting some days lies in the movement of animals. To minimise the

possibility of errors arising in this way it was necessary to use Talbot's wide knowledge of animal behaviour in the region. Where it appeared possible that animals might move some distance before the next flight between counted and uncounted areas, a "buffer zone" was counted which was large enough to include their possible range of movement before the next flight.

A PRIMARY object of the survey was to obtain as accurate a count of wildebeest and zebra as possible. Whenever they did not interfere with this, counts of a number of other species were made. Table 1 gives the results for wildebeest and zebra, compared with previous estimates or counts, which in many cases, particularly Grzimek's, are not directly comparable with the present surveys since they do not claim to have covered the whole region. Grzimek, in fact, included the Ngorongoro Crater and neighbouring areas in his survey, but not what is now known as the Northern Extension of the Serengeti Park.

Table 2 records the species which by reason of their colour, size or habits are, like wildebeest and zebra, easily counted from the air and which were not mingled with these two species to any great extent and could thus be given full attention when encountered.

Table 3 lists species which were less accurately counted either because they frequently occurred together with wildebeest or zebra and were thus given less attention, or because they are difficult to observe from the air.

In the case of Thomson's gazelle the time required to count this very numerous species was not available, and the rough estimate given of their numbers is

NOWHERE IN THE WORLD is there to be found greater concentration of plains game than in the Serengeti. In this picture, taken from the air by Dr. Bernhard Grzimek, Curator of the Frankfurt Zoo, can be seen a few of the tens of thousands of zebra that inhabit the area.

based on a visual impression of their abundance as compared with the numbers of zebra.

WHILST the R.A.F. survey covered the major concentrations of wildebeest and zebra on the open central plains of the Serengeti, and the Wildlife Fauna Research survey included both these animals and those scattered throughout the peripheral areas of bush and plain (as well as the Mara-Loita populations) it would obviously be of the greatest interest and value to be able to compare the Canberra count with the light aircraft one of the same animals.

Such a comparison would confirm or dispel the doubts in the minds of those who felt that the task of counting such vast numbers of animals from a light aircraft was too great a one to be attempted by the methods previously applied.

The photographic reconnaissance aeroplane and the team of expert interpreters of aerial photographs obviously form the most accurate method available for counting animals in such conditions and over such large areas. However, wildlife research workers must usually be content with lesser resources. It is valuable, therefore, if results from the latter are supported by comparison with those from the former.

Such a comparison was eagerly awaited and is made possible in the case of wildebeest by the records

kept of the geographical location of the animals at the time of counting and of the tracks made by the vast herds moving off the plains—tracks that are easily discernible from the air.

On the 15th May the wildebeest and zebra counted by the R.A.F. were concentrated on the south-western part of the central Serengeti plains. On the same day Talbot, on the ground, counted an additional 3,000 wildebeest on the plains but outside the area covered by the R.A.F. These animals, together with the 194,411 counted by the R.A.F., give a grand total on the central plains on 15th May of at least 197,411.

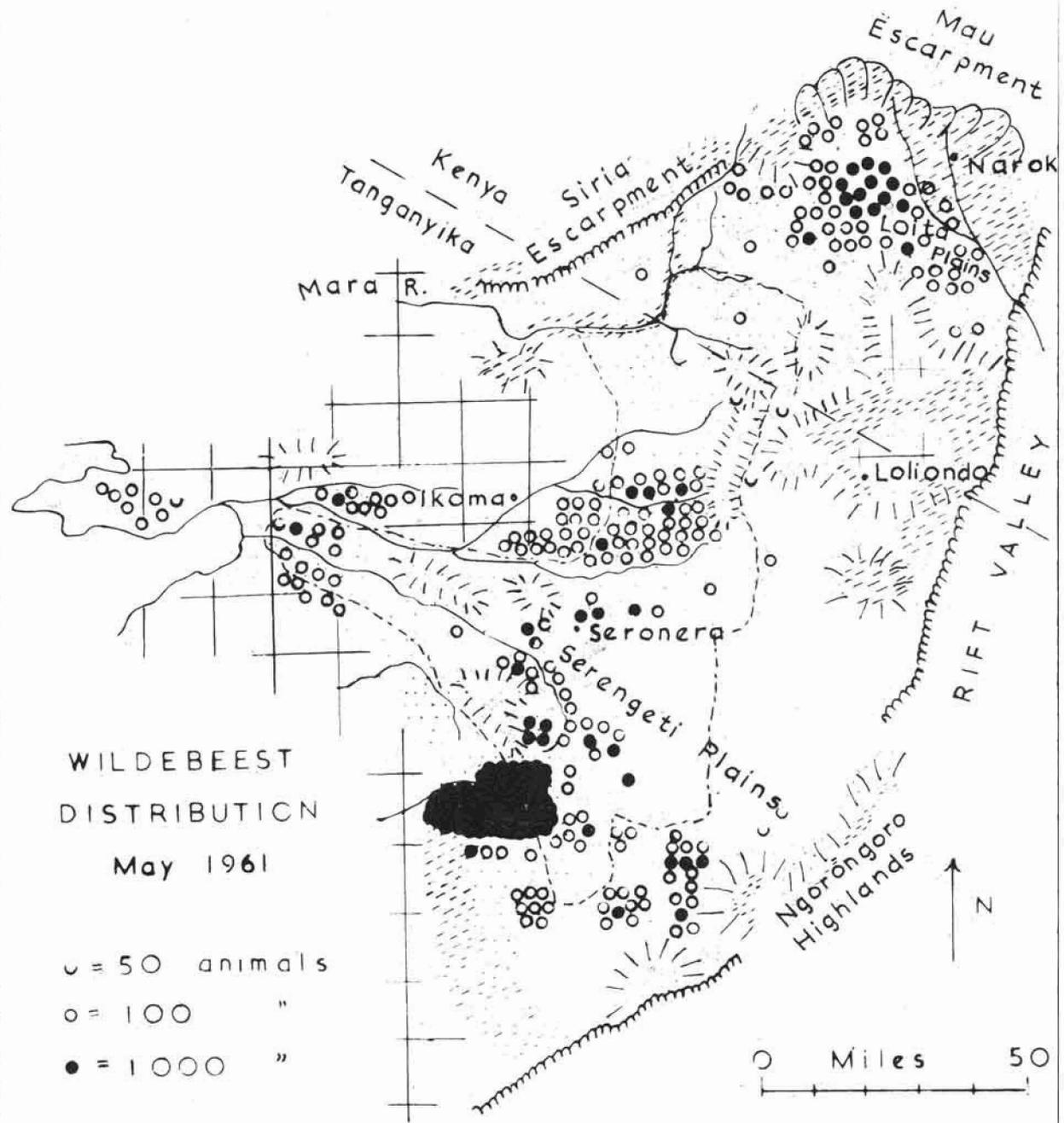
By the 23rd May, when the Wildlife/Fauna Research team reached the Serengeti, there were very few animals left on the central plains but fresh tracks led to a tremendous concentration of wildebeest on the Simiyu River further to the south-west. Other wildebeest between this major concentration and Seronera also appeared to have just left the concentrations surveyed by the R.A.F. and the additional herds seen by Talbot.

There were no fresh tracks, however, towards the herds south and south-east of the central plains, near Ngorongoro Crater and the Eyasi escarpment. Thus these animals had not left the plains in the very recent past, and therefore had almost certainly not been counted by the R.A.F. or by Talbot.

Similarly the wildebeest north of Seronera in the bush to the north-west of the open plains were a long distance from the R.A.F./Talbot area and no fresh tracks were seen between them and the latter, so they undoubtedly were also not counted by either of the two teams.

One is therefore left with the conclusion that the great majority of the wildebeest on the central plains on 15th May had, a week later, congregated on the Simiyu River with smaller numbers going into the bush further north.

Thus the total of 197,411 from the R.A.F. count plus Talbot's additional animals compares with a Wildlife/Fauna Research count of about 200,000 animals. This is a very satisfactory degree of agreement indeed where such large numbers are involved, and supports the view that large numbers of animals can in fact be counted with considerable accuracy, using photographs where necessary, by experienced observers in a light aircraft.



TALBOT/STEWART AERIAL SURVEY COMPARED WITH FORMER COUNTS

SPECIES	SOURCE AND DATE	SERENGETI	MARA	TOTAL
Wildebeest	Pearsall, Nov.-Dec. 1956	101,000	—	—
	Swynnerton, 1956-7	180,000	—	—
	Grzimek, Jan. 1958 (aerial)*	99,481	—	—
	Darling, Oct.-Nov. 1958	—	15,000	—
	Zaphiro and Talbot, Nov. 1959-Nov. 1960 (aerial and ground)	—	7/8,000	—
	Grimwood, April 1960 (aerial)	—	5,897	—
Talbot and Stewart, May 1961	221,699	17,817	239,516	
Zebra	Grzimek, Jan. 1958 (aerial)*	57,199	—	—
	Darling, Oct.-Nov. 1958†	—	12,000	—
	Grimwood, April 1960 (aerial)	—	7,000	—
	Talbot and Stewart, May 1961	151,006	20,867	171,873
Topi	Grzimek, Jan. 1958 (aerial)*	5,172	—	—
	Darling, Oct.-Nov. 1958†	—	4,000	—
	Talbot and Stewart, May 1961	15,766	4,111	19,877
Buffalo	Grzimek, Jan. 1958 (aerial)*	1,813	—	—
	Darling, Oct.-Nov. 1958†	—	4,000	—
	Talbot and Stewart, May 1961	15,898	5,934	21,832
Elephant	Grzimek, Jan. 1958 (aerial)*	60	—	—
	Darling, Oct.-Nov. 1958†	—	500	—
	Talbot and Stewart, May 1961	702	455	1,157

SPECIES	SOURCE AND DATE	SERENGETI	MARA	TOTAL
Kongoni	Grzimek, Jan. 1958 (aerial)*	1,285	—	—
	Darling, Oct.-Nov. 1958†	—	1,000	—
	Talbot and Stewart, May 1961§	1,379	721	2,100
Eland	Grzimek, Jan. 1958 (aerial)*	2,452	—	—
	Darling, Oct.-Nov. 1958†	—	500	—
	Talbot & Stewart, May 1961 (partial count)	2,450	750	3,200
	Estimate based on partial count	4,900-7,350	1,500-2,350	6,400-9,600
Rhinoceros	Grzimek, Jan. 1958 (aerial)*	11	—	—
	Darling, Oct.-Nov. 1958†	—	100	—
	Talbot & Stewart, May 1961§	29	54	83
Thomson's Gazelle	Pearsall, 1953 (ground)	180,000	—	—
	Grzimek, Jan. 1958 (aerial)*	194,654	—	—
	Darling, Oct.-Nov. 1958†	—	12,000	—
	Talbot & Stewart, May 1961 (estimated)	—	—	480,000-800,000
Lion	Temple-Boreham, Talbot, 1961 (ground)	—	200-300	—
	Talbot & Stewart, May 1961 (partial count)	75	84	159
	Estimated	300-400	250-300	550-700

Footnotes: * Excluding Northern Extension added 1958. † Estimate based on sample count. § Minimal count, possibly substantially higher. Serengeti figures exclude Crater Highlands.