

PROGRESS REPORT

PROJECT 28.

INTERIM REPORT ON AERIAL COUNTS
OF WILDLIFE IN ETOSHA NATIONAL PARK.

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1. INTRODUCTION.

Aerial surveys of the central and eastern areas of the Etosha National Park were undertaken during September 1968, April 1969 and February 1970, primarily to establish the efficacy of an aeroplane in counting the larger mammals in the Park and to obtain some idea of the numbers and distribution of the various populations. Previous census methods such as road strip counts and waterhole counts were found inaccurate, unreliable and often impractical in Etosha. The aerial surveys concentrated mainly on zebra, wildebeest, gemsbok and elephant although other species were also counted when they were encountered.

2. METHOD.

A single-engine, two-seater tandem, 150 h.p. Piper Super Cub piloted by Captain N. Maritz on the first two occasions and Mr. M. de Jager on the last occasion was used.

The pilots concentrated mainly on navigation and flying, but assisted with the counting whenever large concentrations were found and when animals had to be counted on either side of the aircraft. Often mixed groups of zebra and wildebeest were found and the pilots then counted one species while the senior writer counted the other. Frequently the aircraft passed directly over animals and these were counted by the pilot otherwise they would have been missed.

The average height flown was 300 feet above the ground with 150 feet as the lowest and 550 feet the highest. Average flying speed was 90 m.p.h. The numbers of animals counted were recorded on a Philips Portable Cartridge Tape Recorder.

Because insufficient time was available for the first two surveys, strips could not be flown. These surveys therefore covered the major waterholes and areas where large concentrations were reported during recent road patrols. As there is very little wildlife between the western limit of Grootvlakte and Otjovasandu/Kowares area, flights in these areas were only undertaken during the first survey. The waterholes were circled in ever-increasing circles up to a

distance of approximately five miles. Tourist roads, old patrol roads and fire-break roads and any outstanding geophysical or vegetational features were used as landmarks. The flight routes of the first two surveys are indicated in MAPS 1 and 2.

On the third survey, the central and eastern portion of the Park excluding the Etosha Salina, an area of approximately 4,600 square miles was conveniently divided into blocks and strips of approximately three miles wide were flown. MAP 3. Because large numbers of elephants were anticipated to be present near the Onaiso Omuramba north of the 19th Latitude, Block N was included in the survey. Rate 1 turns were mostly used excepting where large concentrations were found when Rate 2 were used or when an area was circled. Navigation was controlled as far as possible by the aircraft's direction indication and allowances were made for wind and mechanical drift.

The inter-communication system which was made available for the last survey proved to be of great benefit for communication between the pilot and observer.

Flying for more than 4 hours per day proved to be very tiring. To eliminate fatigue and eye strain, it was attempted to rest during the heat of the day and only fly in the morning and late afternoon.

3. RESULTS.

The results of the surveys are summarised in TABLES 1, 2 and 3. Although these results make no claim to be accurate or conclusive they at least indicate the minimum number of zebra, wildebeest, elephant, gemsbok and giraffe observed.

In TABLE 4 the results of the three surveys are listed and a comparison is made between 1969 and 1970.

4. DISCUSSION.

ZEBRA.

The big difference of 4,214 zebras between 1969 and 1970 could possibly be explained by the following:

- a) The zebra were dispersed over a wide area particularly in Flocks B and C 1 and many could have been missed.
- b) Many zebra had died of anthrax and poachers on Ardoni Plain had taken a large toll of zebra during the previous dry season.
- c) The February count was made during the foaling season resulting in many unborn foals not counted.
- d) Fewer foals were born during 1970 than in the previous year.

Allowing for a bias of 20% the zebra population could be estimated at 13,786 during April 1969 and 8,729 in 1970. With these figures it is possible to state that over the past few years the zebra population of Etosha has not exceeded 15,000 and the population is probably decreasing. A population study may reveal a similar trend.

The distribution of zebra during the rainy season and dry season is indicated in MAP 4. During 1970, approximately 90% of the zebra population was found in Blocks E, C and L, with 52% west of the Etosha Salina and 38% in the Namutoni Fort area.

WILDBEEBEE.

The wildebeest population of Etosha National Park appears to be constant over the past three years. 72% of the population was counted in Blocks E and C west of the Salina (37%) and Flock L in the vicinity of Namutoni Fort (35%). The wildebeest population is estimated to be 5,000. Distribution of wildebeest MAP 5.

GEMSBOK.

A decrease of 746 gemsbok was noted between 1969 and 1970. This decrease may possibly be because gemsbok were widely dispersed during the rainy season and big herds were not encountered. The large numbers of gemsbok counted north of

Namutoni and on Anáoni during April 1959 were not seen during 1970. Poaching may have played a role in this decrease. The present gemsbok population is estimated at under 3,000 and is well distributed throughout the Park.

ELEPHANT.

For the first time the areas south and south-east of Hlalali blocks J and K were covered during the 1970 survey and an additional 126 elephant were counted. This explains the increase over the 1959 survey. In addition 56 elephant were counted east of the Okuma River - an area not included in previous surveys. During an aerial reconnaissance on 2/3/1967, 123 elephant were counted along the Onaiso Omuramba. Seventy more elephant were counted along the omuramba during February, 1970. This omuramba is a favoured elephant habitat during the rainy season. When the rainwater pools dry up, these elephant move south to the borcholas on the 19th latitude. The elephant population is estimated to be approximately 550.

SPRINGBOK.

Springbok are difficult to count from the air and the figures cannot be regarded with any accuracy. The decrease noted in TABLE 4 however does reflect a definite decrease in the population which was also observed during ground patrols. A strong possibility exists that springbok migrate out of the Park to Ovamboland at the end of the wet season.

KUDU.

Kudu are very dispersed during the rainy season and are not easy to count unless they stand in the open. They were easier to count during the dry season when the noise of the aircraft flushed them from the shade of trees into the open. The largest numbers of kudu were found in the Namutoni area.

ELAND.

The decrease in the eland population is very significant because the large numbers seen in the Grootvlekte area during 1959 were seen neither from the air nor from the ground during 1970. Eland are nomadic animals and they probably moved out of the Park.

HARTEBEEST.

Hartebeest are known to move around during the rainy season and the chance of missing small herds are very probable. This explains why more hartebeest were seen during the dry season, when they concentrated near waterholes. Another aerial survey during the dry season will probably confirm this.

GIRAFFE.

More giraffe were counted during the third survey because strips were flown over the densely wooded areas between Halali and Hamuleni which was not the case in previous surveys. The giraffe population of Ltosha is estimated to be over 400.

5. CONCLUSION.

1. Although the aircraft used for the three aerial surveys was suited for this project, more time should be available for the surveys.
2. A four-seater aircraft with three observers would probably be better than a two-seater because this would enable observers to obtain more accurate counts on either side of the aircraft.
3. Dividing the areas to be surveyed into blocks and flying strips is preferable to random waterhole counts. The size of the strips should not exceed 3 miles and should preferably be 2 miles wide. Strips should be flown in an east-west direction to eliminate wind-drift as far as possible. Blocks should not be too big.

4. To complete this project a fourth survey lasting 10 days should be carried out in September or October 1970.

6. SUMMARY.

The results obtained during three aerial surveys in a two-seater Piper Super Cub aircraft are discussed. The estimated populations for the following species in the central and eastern areas of Etosha National Park are:

Zebra	Less than 15,000
Wildebeest	Approx. 5,000
Gemsbok	Less than 3,000
Elephant	Approx. 550
Giraffe	More than 400

A further survey, possibly using a four-seater aircraft with three observers will probably be undertaken in September or October 1971 to terminate this project.

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10/7/1970

W. J. J. J.

TABLE 1.

RESULTS OF AERIAL SURVEY CONDUCTED DURING SEPTEMBER, 1968 (DAY GIBSON AIRBORNE CONTROL COURT).

FLIGHT ROUTE AND DATE.	LIBRA	WILD- BIRD REEST.	SPRING- BOK.	ALL- PHANT	KUDU	BLANK	GIRAFFE	HAMPT- REEST.	GRAMS- BOK.
5TH SEPTEMBER, 1968.									
Okaukuejo-Seeubron-Setco-									
Grunewald-Dam-Along 19th Latitude									
Kowares-Renosterville-Kaross-									
Otjovasendu-Onaeso-Quarantine Camp									
Marawandu-Katanka Pan-Akuna-									
Okondoka-Okaukuejo.									
TOTAL:	c 539	370	295	169	91	2	44	16	412
6TH SEPTEMBER, 1968.									
Okaukuejo-Gabika	717	90	-	3	42	-	-	27	60
-Gasib-Gemsbokvlakte	893	-	-	-	-	-	-	-	54
-Bordor-Kapupuhedi	c1208	21	-	-	20	-	-	18	116
Clifantsbad-Lus-Gobaub	c1513	278	-	-	56	-	-	65	43
-Telletli-Charitvsaub	368	725	-	-	68	-	-	-	301
-Okaukuejo.	79	52	-	-	16	-	-	-	142
TOTAL:	4778	1166	654	3	232	103	59	110	716
7TH SEPTEMBER, 1968.									
Okaukuejo-Homob	112	61	-	-	-	-	-	-	51
-Along Pan-Okerfontein	-	883	-	36	6	-	-	14	33
-Landeri	60	418	-	-	6	-	-	-	65
-Pamatoni-Twee Palas-Loin Kamatoni	c 356	c 298	-	-	117	-	-	-	16
-Stadop	135	49	-	-	186	-	-	-	-
-Kalkkhuurel	61	-	-	-	29	-	-	-	-
-Kopje	292	-	-	-	17	-	-	-	-
-Okerfontein	c1768	378	-	63	16	-	-	-	61
-Springbokfontein	519	159	-	6	c 40	-	-	15	141
-Agal	456	78	-	1	44	-	-	15	43
-Langeries-Kwinsob	258	68	-	-	6	-	-	164	15
-Goas	371	72	-	-	32	-	-	76	12
-Oetfontein	129	73	-	12	86	-	-	-	46
-Okaukuejo.	-	-	-	9	-	-	-	-	-
TOTAL:	4539	2537	768	129	587	24	15	287	483
GRAND TOTAL:									
	9856	4073	1717	301	666	129	118	413	1611

by Okonkueje - Grootdam road in northern boundary fence in south and line running from Grootdam to southern boundary.

B. Grootvlakte area. Bounded by road from Sprokkieswoud to Grootdam, road from Grootdam to southern boundary fence, Safarinoek Omuramba to Grootdam.

C. East of Grootvlakte. Area bounded by road Sprokkieswoud to Grootdam, Sprokkieswoud to Hitec - Leeubron road junction, Hitec/Adamax road and northern edge of Omuramba between Grootdam and Okondeka Pan.

L&E. Hitec-Adamax, Adamax Okondeka, Okondeka-Leeubron. Okondeka - Leeubron - Okonkueje.

F&G. Okonkueje-Ombika (East of road) Gasek. Gembobvlakte to southern border of Etosha Salina to southern boundary fence. Gotub and Gous.

H. Hoas-vilali. Agab-Sprin-bokfontein-Mobib-Okerfontein. Mamutoni-Kalkheuvel, Keingas-Chudop. Klein Mamutoni.

I. Fishers Pan.

J. Peninsulæ north of Mamutoni - Mamutoni - Kushara.

K. Starksvlakte-Onama-roe-Mamutoni.

871	24	+ 300	-	-	17	2	32	1	155	22
2438	1337	+ 930	3	4	-	270	-	8	202	203
1783	48	+ 250	-	-	-	99	5	-	192	110
858	205	+ 281	-	3	-	-	-	-	194	-
2089	203	+ 262	-	-	-	6	1	38	193	138
615	433	+ 656	-	11	9	-	7	-	198	-
1307	369	+ 374	-	1	47	154	16	-	159	66
1073	1100	+1382	25	5	57	40	47	8	155	21
298	474	+ 860	-	1	14	-	55	-	21	56
18	202	+1092	-	2	16	-	2	-	657	247
58	378	+ 101	36	-	8	1	21	-	202	13
11,488	4773	+648	64	27	170	572	166	131	2328	856

Estimated population based on survey:

Zetra 10,000 - 12,500
 Hildabeest + 5,000
 Sprinbok 6,500 - 7,000
 Eland 600 - 800
 Gemsbok 2,500 - 3,250.

TABLE 3.

RESULTS OF AERIAL SURVEY CONDUCTED FROM 16-24 FEBRUARY, 1970. (LIT SEASONS).

(AVERAGE HEIGHT ABOVE GROUND 200-450 FEET - SPREAD 65-95 M.P.H.)

DATE	AREA BLOCK	STRIPS NO.	LEBR.	MILDS-BEAST.	SPRING-BOK.	SIL-PHANT	LION	KUDU	BLAND	GIAMFL	MILDS-FLYST.	LEBR-FOE.	OSTAICH.
16.2.1970	A	12	365	16	?	1	-	-	29	29	30	54	62
16.2.1970	B	9	1512	226	?	1	-	-	3	20	10	69	204
16.2.1970	C1	12	1075	1542	1671	-	3	-	3	3	6	363	194
19.2.1970	C2	-	1209	14	?	-	-	-	3	7	-	50	118
16.2.1970	D1	8	-	5	-	-	-	-	-	-	-	164	85
19.2.1970	D2	-	-	211	254	106	-	-	-	-	-	30	76
18.2.1970	D3	7	-	-	-	-	-	-	-	13	3	55	16
17.2.1970	E	12	12	55	+ 28	-	2	-	-	6	-	36	21
18.2.1970	F1	8	11	11	17	-	-	13	6	21	15	61	38
19.2.1970	F2	17	5	79	+ 60	1	-	2	-	9	4	59	89
18.2.1970	G	13	30	218	526	27	-	10	+ 24	13	9	32	48
17.2.1970	H1	8	-	115	117	-	-	-	-	18	7	9	25
17.2.1970	H2	14	-	107	-	39	-	12	-	24	6	20	72
17.2.1970	I	19	-	122	+ 554	-	5	19	3	29	2	56	95
17.2.1970	J	8	29	18	39	71	-	-	-	35	21	35	21
20.2.1970	K	15	145	1	-	55	-	9	-	56	4	16	3
23.2.1970	L1	17	2635	1058	+ 799	-	-	63	24	50	-	103	21
23.2.1970	L2	10	166	395	+ 101	-	-	4	-	5	-	-	36
23.2.1970	L3	-	62	210	30	-	-	27	-	2	-	29	74
23.2.1970	M1	8	18	356	+ 21	-	-	2	-	12	-	2	111
3.2.1970	M2&3	-	-	28	-	-	-	-	-	-	-	202	125
24.2.1970	N	-	-	2	4	193	-	-	-	-	19	44	22

TOTAL:

7274 + 4381

494

95

15

190

167

19.2.1970	C2	-	1242	1071	-	3	-	3	0	383	194
19.2.1970	C2	-	14	?	-	-	-	3	7	50	118
16.2.1970	D1	8	5	-	-	-	-	-	-	164	85
19.2.1970	D2	-	211	254	106	-	-	-	-	30	76
16.2.1970	D3	7	-	-	-	-	-	-	13	55	16
17.2.1970	E	12	55	+ 28	-	2	-	-	6	36	21
16.2.1970	F1	8	11	17	-	-	13	6	21	61	38
19.2.1970	F2	17	79	+ 60	1	-	2	-	9	59	89
16.2.1970	G	13	30	526	27	-	10	+ 24	13	32	48
17.2.1970	H1	8	-	117	-	-	-	-	18	9	23
17.2.1970	H2	14	-	107	39	-	12	-	24	20	72
17.2.1970	I	19	-	122	+ 554	5	19	3	29	56	95
17.2.1970	J	6	29	18	39	71	-	-	35	36	21
20.2.1970	K	15	145	1	-	55	-	9	56	18	3
23.2.1970	L1	17	2635	+ 759	-	-	63	24	90	153	21
23.2.1970	L2	10	166	+ 151	-	-	4	-	5	-	36
23.2.1970	L3	-	62	30	-	-	27	-	2	29	74
23.2.1970	M1	8	18	355	+ 21	-	2	-	12	2	111
23.2.1970	MR33	-	-	28	-	-	-	-	-	202	125
24.2.1970	N	-	-	2	4	193	-	-	-	44	22
TOTAL:		7274	4789	+4161	484	10	761	95	105	198	165

TOTAL NO. OF ANIMALS COUNTED: 20,752.

BLOCK G : 1 Black Rhino.

L, FL&F2 : spoor of black rhino and elephant.

D3 : Evidence of elephant, but none seen.

TABLE 4.

COMPARISON BETWEEN THREE ANIMAL CULVICS IN LEOGAMA NATIONAL PARK.

(SEPTEMBER, 1968 - DRY SEASON. APRIL, 1969 - END OF WET SEASON. FEBRUARY, 1970 - WET SEASON).

	APRIL, 1969.	MAY, 1970.	DIFFERENTIAL BETWEEN 1969 and 1970.
ZEBRA.	11,488	7,274	Decrease 4,214
WILDBULB.	4,773	4,769	Constant.
SPRINGBOK.	6,408	4,181	Decrease 2,307
REMPANT.	64	494	Increase 300
GAMBOZ.	2,328	1,562	Decrease 746
KUDU.	170	161	Constant.
ELAND.	572	95	Decrease 477
GIANT.	166	392	Increase 226
LEOPARD.	131	126	Constant.
CATERPILLAR.	856	1,658	Increase 802