1977

N.25/3

MARCH 1977 GAME CENSUS IN ETOSHA NATIONAL PARK BY HELICOPTER

Responsible officers:

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R. Kyle (Areas II, III, IV)
A. van Wyk and T. Nolan (Karoos - Khomendes)

Pilots:

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N. Maritz (Areas I - IV)

Recording Transcription (Mrs.) C. Berry

Contents:

1. INTRODUCTION

In September 1973 and July 1974, Joubert et al. and Berry et al. carried out a census of Etosha by helicopter. During 1975 the helicopter was not available for a game census. In July 1976 the third winter census of large animals was done. The first summer census of Etosha was done by helicopter in March 1977.

2. METHOD

"Hughes 300" helicopter (see previous reports for method).

The main game reserve was censussed from 21 - 30 March and Kaross - Khombendes on 13 April.

Fig. 1. indicates the intensity of transects flown as well as the flight path over sparsely populated areas. The pilots assisted during the counts when large concentrations of animals were encountered.

Censusing was undertaken consecutively for five days with two days interruption for rest and helicopter service and then continued for a further four successive days. The last (10th) day of counting was abandoned due to a shortage of fuel (leaking drums and short-filled drums) plus the fact that the helicopter was called to Waterberg to search for escaped White Rhinos.

Table 1 reflects the time of day flown and the time allocated to each area. Shadow-effect was too pronounced before 06h00 and after 18h00 to count accurately.

The average air speed at which counts were done varied from hovering to 100 - 130 km/h, depending on the wind. Height above ground varied from 30 m. when counting springbok on the plains to 100 m. when counting elephant in Mopane veld. Operating temperature ranged from 17°C at 08h00 to 30° at 15h00.

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3. RESULTS

Table II gives the species totals for Etosha National Park, subdivided into seven main areas. Table III shows some bird species counted. Table IV compares the grand totals of the helicopter censuses to date. Figs. II - XIV are histograms of the herd (or pride or flock) size of the commoner species.

4. DISCUSSION

4.1 Burchell's Zebra: (Fig. II)

Areas of greatest concentration were Okaukuejo and Otjovasandu (69% and 18% of the total population occurred there respectively).

Otjovasandu's number increased sharply (1121 to 1804) but zebra declined in total by 7%. This supports the 1976 prediction that Etosha's zebra population is decreasing, i.e. if Otjovasandu's zebras are regarded as a separate population from the rest of Etosha, then in fact the 9176 zebra in the rest of Etosha (1976) have declined to 7979 (1977), which is a further drop of 11%.

Between 1974 and 1976 a drop of 30% in the total zebra population was reported, but my figures were questioned at the 1976 professional officers' meeting and my conclusions were criticised.

I wish to re-iterate to my conviction that there has been a substantial reduction in the number of zebra in Etosha since helicopter counts were begun in 1973.

This statement is further supported by foal counts made from the helicopter (sample of 6924 adults and 721 foals = 10%, cf. 11% foals in 1976, 15% foals in 1974 and 12% in 1973). The 1977 foal count is alarmingly low if it is remembered that the census was conducted at the end of March, which is normally just after the peak foaling period.

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Ground counts made by the research staff and the conservators support the aerial foal counts.

.2 Hartmann's Zebra: (Fig. III).

Similar to Burchell's Zebra there was a sharp increase in the Otjovasandu area (599 to 840). Percentage foals is 18%.

.3 Blue Wildebeest: (Fig. IV).

There is an increase in total population (2638 to 3059) but this is largely due to the presence of newly-born calves which will almost certainly decrease by the July 1977 census. The census was conducted just after the calving season had ended. A sample of 2234 adults and 418 calves gives a calving percentage of 19%. In May 1976 it was 25%, in July 1976 it was 22% and in December 1976 it was 22%.

Thus: 3717 (1973), 3300 (1974), 2638 (1976) and 3059 (peak count 1977).

The Otjovasandu herd of 28 was last seen in December 1976; only 2 solitary bulls were recorded near Onguntindi - Onanderi in 1977.

Territorial bulls comprised 5% of the total population (2% in 1974 and 1976). This can be explained by the approaching mating season.

.4 Hartebeest: (Fig. V)

Percentage calves is 9% (8% in 1976, 3% in 1974). The population shows an increase in the 1976 census (179 to 260).

.5 **Springbok:** (Fig. VI)

A very definite and highly significant increase from 10432 (1976) to between 20642 - 24179 (1977). Three possible reasons contributing to this high count are:

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i. A lambing season which began in December and continued until March (a sample of 515 adults had 185 lambs = [illegible]).

ii. A greater concentration of springbok from the bush areas on the plains, resulting in a higher total count.

iii. Immigration of springbok into Etosha from [illegible].

The range given in the Okaukuejo area is 14502 - [illegible]. This is because it is possible that a large, migrating herd was counted in the Okondeka - Andoni area. Solitary rams comprised 0,5% of the total population (1% in 1974 and 1976).

4.6 Gemsbok: (Fig. VII)

Solitary bulls comprise 4% of the total population (11% in 1976, 6% in 1974). The percentage of calves was 7% (3,7% in 1976, 3,5% in 1974). There is a population increase (2382 to 3172).

4.7 Kudu: (Fig. VIII)

The total count is much lower than 1976 (1267 vs. 838) but this is probably due to the lowered visibility of the summer count. Bull : cow ratio is 1 : 2,2 (same as 1976, 1 : 3,5 in 1974). Percentage calves is 13% (16% in 1976, 21% in 1974).

4.8 Eland: (Fig. IX)

Etosha's figures (excluding Kaross/Khobendes) were 81 (1974), 69 (1976), 63 (1977). Of the 63 eland seen, 9 were calves (14%).

4.9 Giraffe: (Fig. X)

Solitary animals comprised 5% of the population (9% in 1976, 20% in 1974). Percentage calves is 25% (13% in 1976 and 1974). The decrease in numbers is probably due to lowered visibility in summer.

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4.10 Warthog: (Fig. XI)

Otjovasandu holds 68% of Etosha's warthog. Piglets comprised 44% of the population (40% in 1976, 14% in 1974).

4.11 Elephant: (Fig. XII)

A surprisingly large number of elephant were present in Etosha, taking into account the time of the year. Of the 836 elephant 55% were in the Otjivalundu - Okuma - Oshigambo block. 23% were at Otjovasandu and 17% were on the 19th latitude. The greatest number of bulls found together was 2 (cf. up to 6 in 1976). There are 33 distinct breeding herds (32 in 1976). Young elephant (< 10 years) comprise 57% of the population (41% in 1976, 35% in 1974).

4.12 Lion: (Fig. XIII)

The largest pride seen was 14, with 2 cubs seen in total.

4.13 Ostrich: (Fig. XIV)

Okaukuejo holds 37% of the total population (481 out of 1298). Cock : hen ration is 1 : 0,8 (1 : 0,4 in 1976, 1 : 0,6 in 1974).

4.14 General: We were allowed 60 flying hours to complete the census (including the return ferry to Windhoek). Total time recorded on the helicopter's clock was 59 hours 40 mins (Table 1), but the actual census time was 49 hrs. 30 mins. because 6 hrs. 30 min. was allocated to ferrying and 3 hrs. 40 mins. was miscellaneous, such as warming up and testing the helicopter. The 1973/74/76 censuses were 40½, 55½ and 49½ hrs. actual census time.

As in the previous years our figures are thus not a reflection of total animals with the exception of the wildebeest which we feel was totally censused. It is the most accurate count of the census, followed by plains zebra, mountain zebra and springbok.

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An over-all impression of the census was the very poor to fair grazing available and the scarcity of rainwater pools. Table V gives the occurrence of seasonal water.

It is interesting to note that the estimated 30 000 ha of Pan which was covered with a pure stand of Sporobolus salsus in 1976 will probably not have any stand in 1977 due to the low and badly distributed rainfall (the area concerned had 50% of the seasonal total of 420 mm at the end of March 1977 and a total of 232 mm at the end of April 1977).

5. COST

	R C
Hire of helicopter	
(50,7 hrs. at R45/hr)	2281 - 50
Fuel truck (1437 km at 14,2c/km)	204 - 05
Nature Conservation personnel salary	
(2 Europeans for 9 days)	369 - 45
(1 non-European for 9 days)	24 - 17
5 % T for personnel	196 - 53
Total:	3075 - 70

6. CONCLUSIONS

6.1 The summer census was fully warranted because of the variation in seasonal distribution of the animals which is evident.

6.2 Moreover, it has substantiated earlier predictions that on the plains surrounding the Pan there is a marked decrease in Burchell's Zebra, while springbok have reached numbers not previously recorded in the present day Etosha. Wildebeest, on the other hand may have reached the lower limits of the population decrease and their population may be stabilising. Further counts to verify this will be necessary.

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6.3 The Otjovasandu area, on the other hand, shows a sharp increase in most large mammals, especially the two zebra species, the gemsbok, springbok and giraffe. In all cases this may be due to the low predation and disease pressure at Otjovasandu (very few lions and anthrax is absent).

Comparatively, the plains surrounding the Pan have many more lions and a high incidence of anthrax. The high numbers of springbok on these plains could well be because of low predation pressure (specifically cheetah; lion rarely catch springbok).

7. RECOMMENDATIONS

7.1 Two general censuses of Etosha should be conducted by helicopter every seasonal year : one at the height of the rainy season (Feb/Mar.) and one in the dry season before ambient temperatures begin increasing (July/Aug.).

7.2 In addition two interim censuses of the plains animals only should be done midway between the general censuses, namely May and November, using the helicopter.

7.3 The actual census time should be increased to 60 flying hours plus about 10 hours for ferry and warm-up, that is to say 70 hours for each general census. When Kaross/Khoabendes are included it will amount to 75 hours.

For the counts on plains animals only, 30 census hours are required, plus ferry and warm-up of about 10 hours = 40 hours total. Kaross/Khoabendes need not be counted during the interim censuses.

7.4 Observers and pilot should be kept constant to keep error in censusing to a minimum.

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8. ACKNOWLEDGEMENTS

The pilots, Messrs. de Jager and Fritz are thanked for their assistance with the counts and Mrs. Berry is thanked for undertaking the transcription of recordings and compiling the histograms. The tourist officers at all camps did their best to provide accomodation for the crew at short notice.

9. REFERENCES

BERRY, H. et al.

1974 and 1976 game census in Etosha National Park by helicopter. Dept. reports N.25/3 dated 8 August 1975 and 16 October 1976.

JOUBERT, E. et al.

Lugsensus van die wild in die Nasionale Etoshawildtuin gedurende September 1973 met behulp van 'n helikopter.
Dept. verslag N.25/3 gedateer 13 November 1973.

H.H. BERRY

27th April 1977

Table I: Time of day flown and time allocated to areas censused.

DAY	AREA	Time (hours) START	END	FLIGHT TOTAL	DAY TOTAL +
1	VIII	08h00	10h00	2 : 00'	6 : 05'
	VIII and	10h30	12h35	2 : 05'	
	VII	16h00	18h00	2 : 00'	
2	VII	08h00	10h00	2 : 00'	6 : 05'
	VI	10h25	12h25	2 : 00'	
		15h45	17h50	2 : 05'	
3	VI	08h00	10h15	2 : 15'	6 : 30'
	V and	10h45	12h50	2 : 05'	
	IV	15h50	18h00	2 : 10'	
4	IV	08h00	10h35	2 : 35'	6 : 15'
		11h00	12h40	1 : 40'	
		15h55	17h55	2 : 00'	
5	IV	08h05	10h15	2 : 10'	6 : 20'
		12h20	14h15	1 : 15'	
		15h00	17h15	2 : 15'	
6	III	08h10	11h10	3 : 00'	7 : 50'
	II	11h40	13h55	2 : 20'	
	I	15h00	17h30	2 : 30'	
7	I	08h10	10h50	2 : 40'	6 : 15'
		11h30	14h10	2 : 40'	
		15h30	16h25	0 : 55'	
8	I	08h10	10h30	2 : 20'	4 : 30'
	II, III	11h30	13h40	2 : 10'	
9	IV	09h00	11h30	2 : 30'	2 : 30'

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DAY	AREA	Time (hours) START	END	FLIGHT TOTAL	DAY TOTAL +
Miscellaneous flying time.	IV	Test run following service			0 : 15'
	I	Orientation of new nature conservator			0 : 35'
	Ferry from Windhoek and back				6 : 30'
				Total	59 : 40'

+ Gross total is 59 **hrs** 40 min less 7 hrs 20 mins ferry and miscellaneous, less 2 hrs 50 mins flying to and from census areas.

Therefore net census time is 49 hrs 30 mins (cf. 49 hrs 15 mins in 1976).

In addition Kaross – Khoabendes was censused on 13 April 1977 : total count time 5 hrs 35 mins.

TABLE II: ANIMAL SPECIES TOTALS IN THE 7 MAIN AREAS OF ETOSHA NATIONAL PARK

SPECIES	AREA						
	Namutoni	Halali	Gobaub	Okaukuejo	19th Latitude	Otjovasandu	Kaross/ Khoabendes
Burchell's Zebra	593	19	7	7097	263	1304	102
Hartmann's Zebra	0	0	0	0	0	848	163
Blue Wildebeest	1367	25	54	1611	0	2	0
Red Hartebeest	5	9	17	12	64	153	2
Springbok	3122	930	81	14502 - 18039+	1307	700	1
Roan Antelope	0	0	0	0	0	0	163
Gemsbok	220	101	59	642	322	1828	795
Black-faced Impala	0	0	0	0	0	38	300
Kudu	48	15	16	4	14	352	389
Steenbok	6	2	0	6	19	4	9
Grimm's Duiker	0	0	0	0	1	0	0
Southern Reedbuck	0	0	0	0	0	1	0
Eland	0	0	0	0	15	48	382
Giraffe	171	4	25	99	8	289	291
Warthog	16	4	0	19	26	138	133
Black Rhino	0	3	0	1	3	22	11
Elephant	0	42	0	462	142	190	0
Lion	11	0	0	35	0	0	0
Cheetah	1	0	0	0	0	0	0
African Wild Cat	0	0	0	1	1	0	0
Honey Badger	0	0	0	0	1	0	0
Brown Hyena	0	0	0	1	1	0	0

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TABLE II (Continued)

SPECIES	AREA						
	Namutoni	Halali	Gobaub	Okaukuejo	19th Latitude	Otjovasandu	Kaross/ Khoabendes
Black-backed Jackal	6	3	0	15	3	1	0
Cape Fox	0	0	0	0	1	0	0
Bat-eared Fox	12	0	0	0	3	0	0
Baboon	0	0	0	0	0	30	0
Total animals by area	5578	1157	259	24506 - 28043 +	2193	6448	2741

Total animals counted 42882 - 46419+

+ A range is given due to the possibility of a double count of a migrating herd.

TABLE III: SOME BIRD SPECIES COUNTED IN ETOSHA NATIONAL PARK.

SPECIES	AREA						
	Namutoni	Halali	Gobaub	Okaukuejo	19th Latitude	Otjovasandu	Totals
Ostrich	251	86	19	481	253	208++	1 382
Kori Bustard	45	35	5	104	8	4	209
Guineafowl+	0	130(3)	0	150(2)	0	80(3)	360(8)
White Pelican	0	0	0	0	0	0	0
Flamingoes	24 900	0	0	0	0	0	24 900
Blue Crane	6	48	0	2	0	0	56
Saddlebill	0	0	0	0	0	0	0
White-backed Vulture	158	0	30	75	0	6	269
Lappet-faced Vulture	3	0	0	10	1	7	21
Vulture unidentified	0	0	0	29	6	0	35
Black-breasted Snake Eagle	0	2	0	1	0	0	3
Bataleur	3	1	1 Imm	13 + 3 Imm	1	1	23
Tawny Eagle	0	0	0	4	2	2	8
Secretary Bird	5	5	0	17 + 1 chick	3	2	33
Eagle unidentified	0	3	0	3	5	2	13
Egrets	20	0	0	0	0	0	20
Grey-headed Gull	100's	0	0	0	0	0	100's
Red-bill Teal	1 000's	0	0	0	0	0	1 000's
Cape Teal	0	0	0	1000's	0	0	1 000's
Waders	10 000's	0	0	0	0	0	10 000's
Crowned Crane	2	0	0	0	0	0	2
White Stork	12	0	0	0	0	0	12
Marabou	2	0	0	0	0	2	4
Ludwig's Bustard	0	0	0	1	0	0	1

+ = Number of flocks given in brackets

TABLE IV: COMPARISON OF 1973, 1974, 1976 AND 1977 CENSUSES

SPECIES	YEAR			
	September 1973	July 1974	July 1976	March 1977
Burchell's Zebra	12 496	14 550	10 418	✓ 9 885
Hartmann's Zebra	736	554	599	✓ 1 011
Blue Wildebeest	3 717	3 300	2 638	✓ 3 059
Red Hartebeest	549	234	179	✓ 262
Springbok	5 262	7 011	10 433	✓ 20 643 - 24 180+
Roan Antelope	159	177	204	✓ 163
Gemsbok	3 708	2 537	2 382	✓ 3 967
Black-faced Impala	271	352	379	✓ 337
Kudu	2 101	1 223	1 267	✓ 838
Steenbok	156	25	11	✓ 42
Grimm's Duiker	29	3	0	✓ 1
Southern Reedbuck	1	0	0	1
Eland	423	289	527	✓ 445
Giraffe	935	963	735	✓ 887
Warthog	147	209	177	✓ 336
Black Rhino	63	36	45	✓ 40
Elephant	1 293	835	1 170	✓ 836
Lion	137	80	70	✓ 46
Black-backed Jackal	99	77	36	✓ 28
Bat-eared Fox	8	10	1	✓ 15
Baboon	-	15	70	✓ 30

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TABLE IV (CONTINUED)

SPECIES	YEAR			
	September 1973	July 1974	July 1976	March 1977
Ostrich	719	757	751	1 382
Kori Bustard	209	128	138	209
Guineafowl (flocks)	-(45)	2 120(44)	1 610(28)	360(8)
Secretary Bird	7	19	17	33
Blue Crane	16	18	138	56
White-backed Vulture	-	22	73	269
Lappet-faced Vulture	-	12	4	21
White Pelican	-	1 712	251	0
Flamingoes	-	187 200	10 507	24 900

TABLE V: OCCURRENCE OF SEASONAL WATER IN ETOSHA DURING MARCH 1977.

DATE	LOCATION	REMARKS
21/3	Makalani plus gravelpits Kameeldoring, Beisebvlakte, Andoni. Omuramba Owambo - only pools Kalkheuwel gravelpits	Noticeably little water in all these areas
22/3	Komoseb - Dungaries	Scattered turf pans.
23/3	Aus - Olifantsbad gravel pits Gaseb gravel pits, Wit Olifantdam	Will soon be dry. Fair amounts
24/3	Ekuma river Ochigambo river Pannetjiesveld east and west of Ekuma	Dislocated pools Dislocated pools Numerous turf pans
25/3	Grootvlakte gravel pit Grootvlakte omuramba	Fair amount Pools
28/3	Onangonbati, Onantinda, Onandera. Pans north of Dolomietpunt	Very full Scattered
29/3	Zebradam plus omuramba Klippan and Renostervlei area Kalahari - Jakkalswater Okaukuejo - Duikerdrink areas	Full Pans Numerous Pans

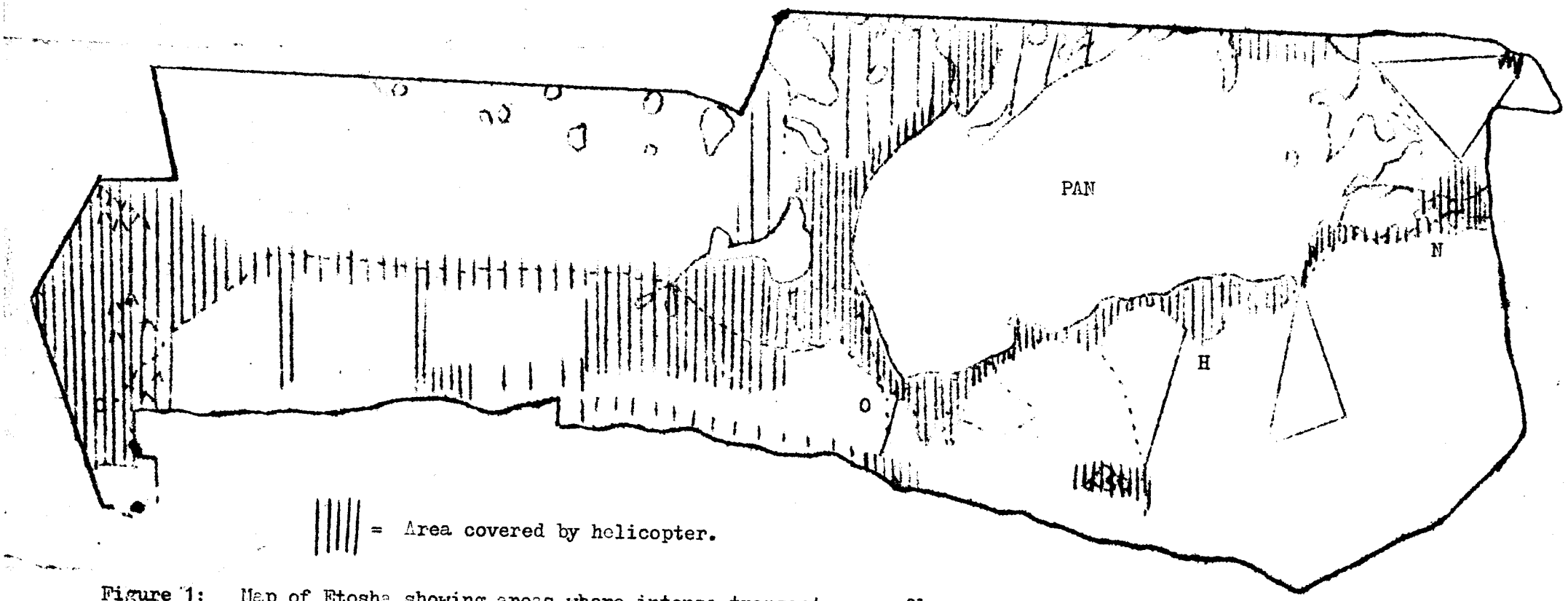


Figure 1: Map of Etosha showing areas where intense transects were flown.

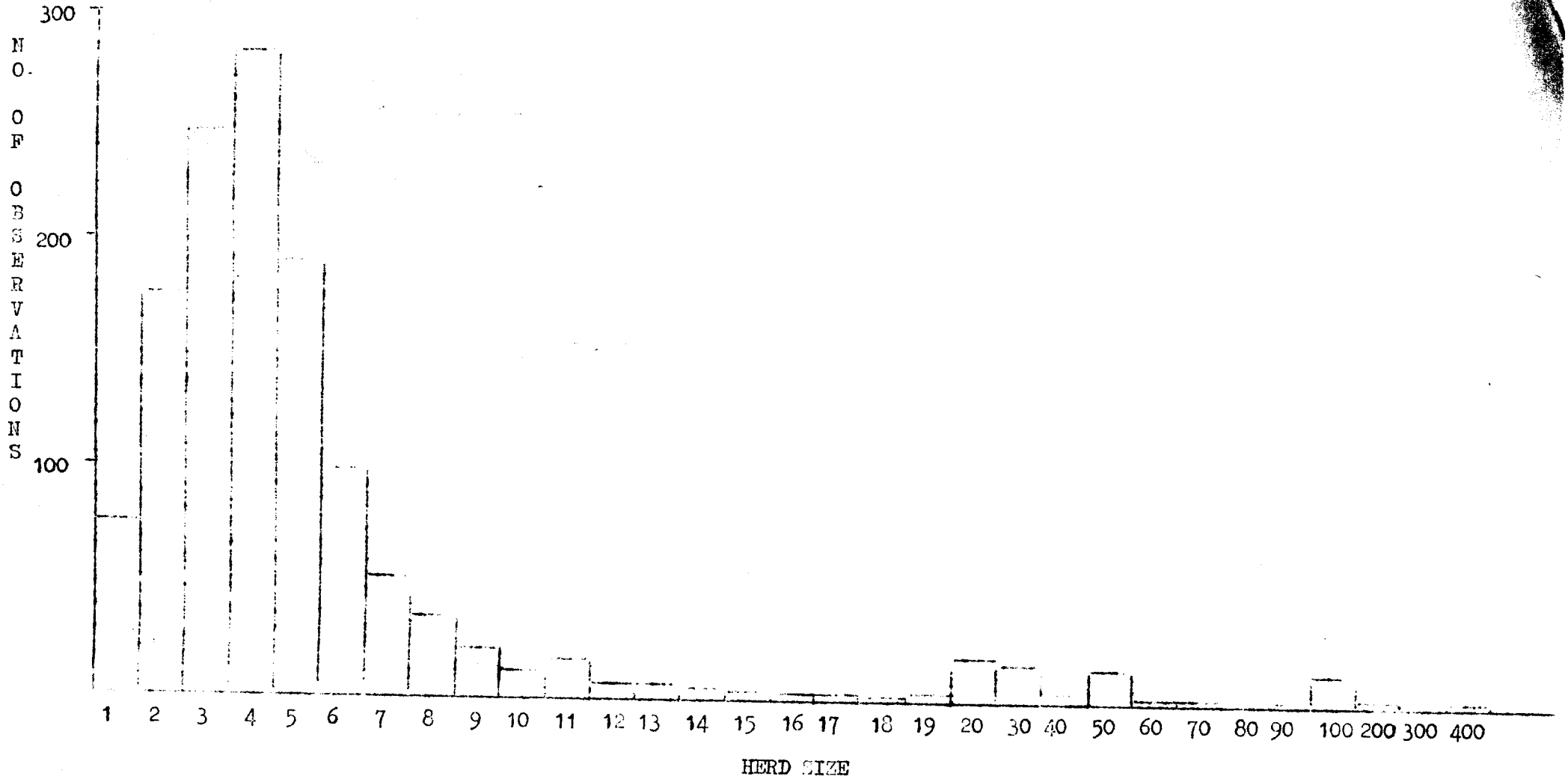


FIG. II: BURCHELL'S ZEBR

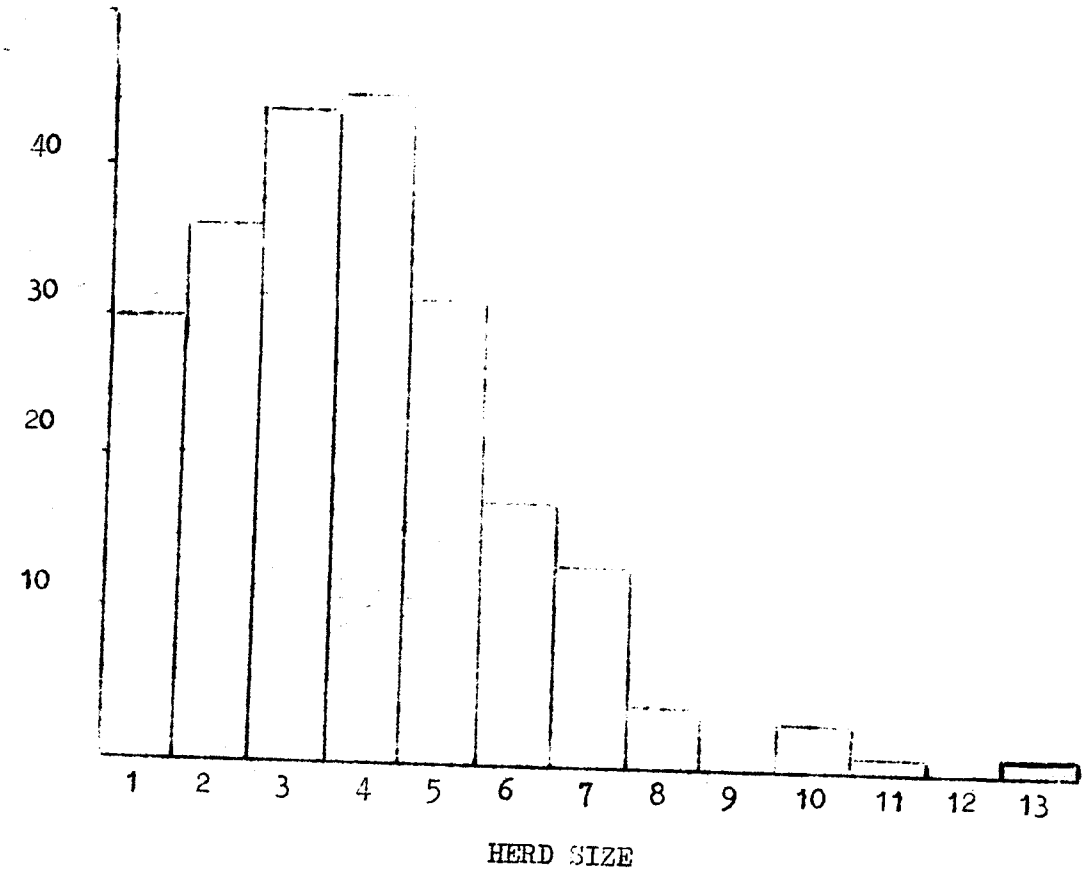
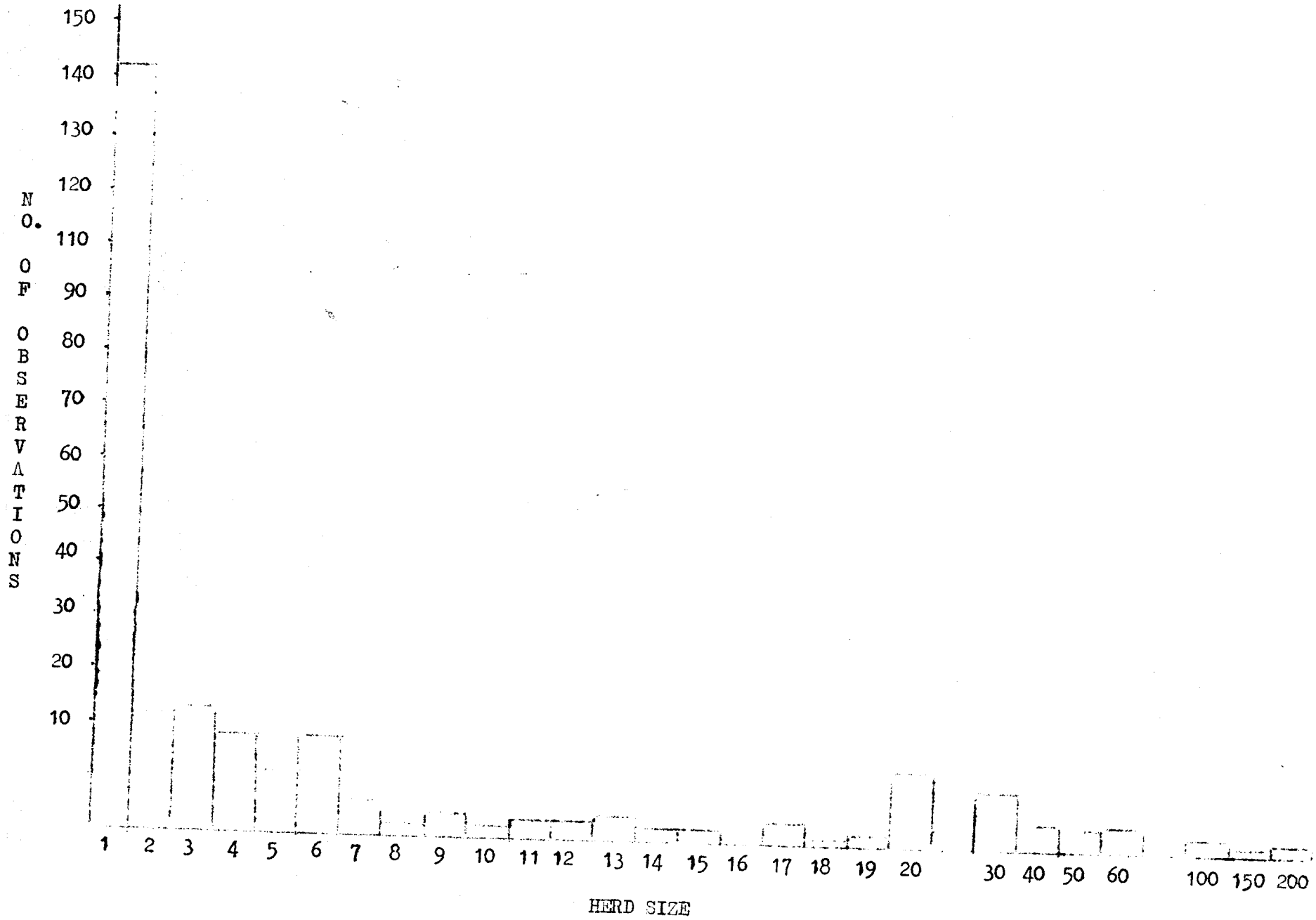


FIG. III: HARTMANN'S ZEBRA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NO. OF OBSERVATIONS
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 30 40 50 60 100 150 200
HERD SIZE

FIG. IV: [illegible]

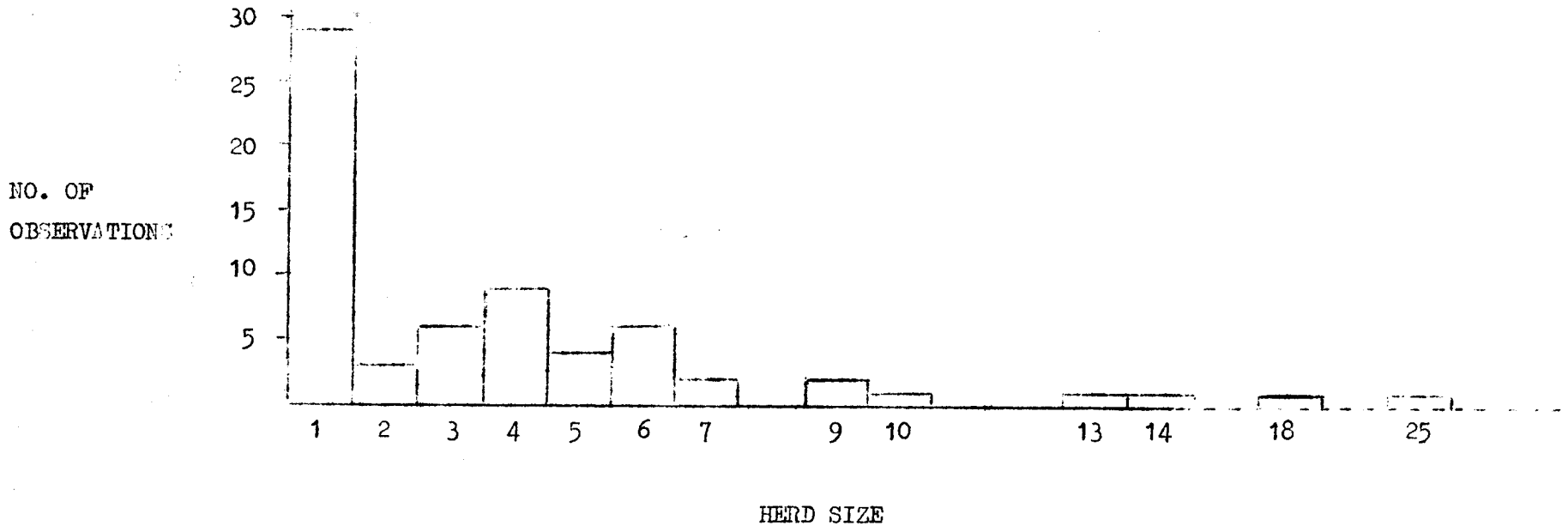


FIG. V: RED HARTEBEEST

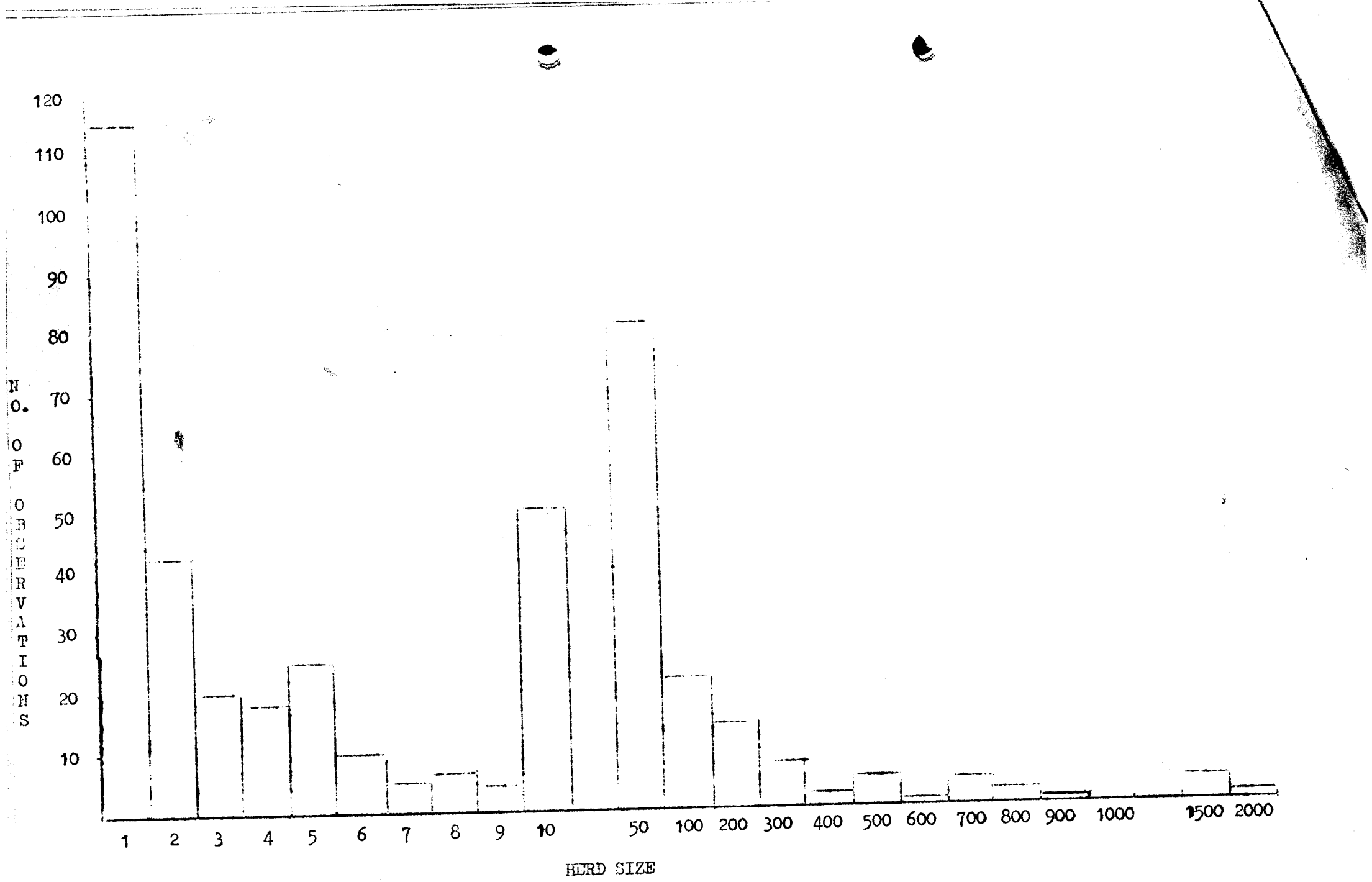


FIG. VI: SPRINGBOK

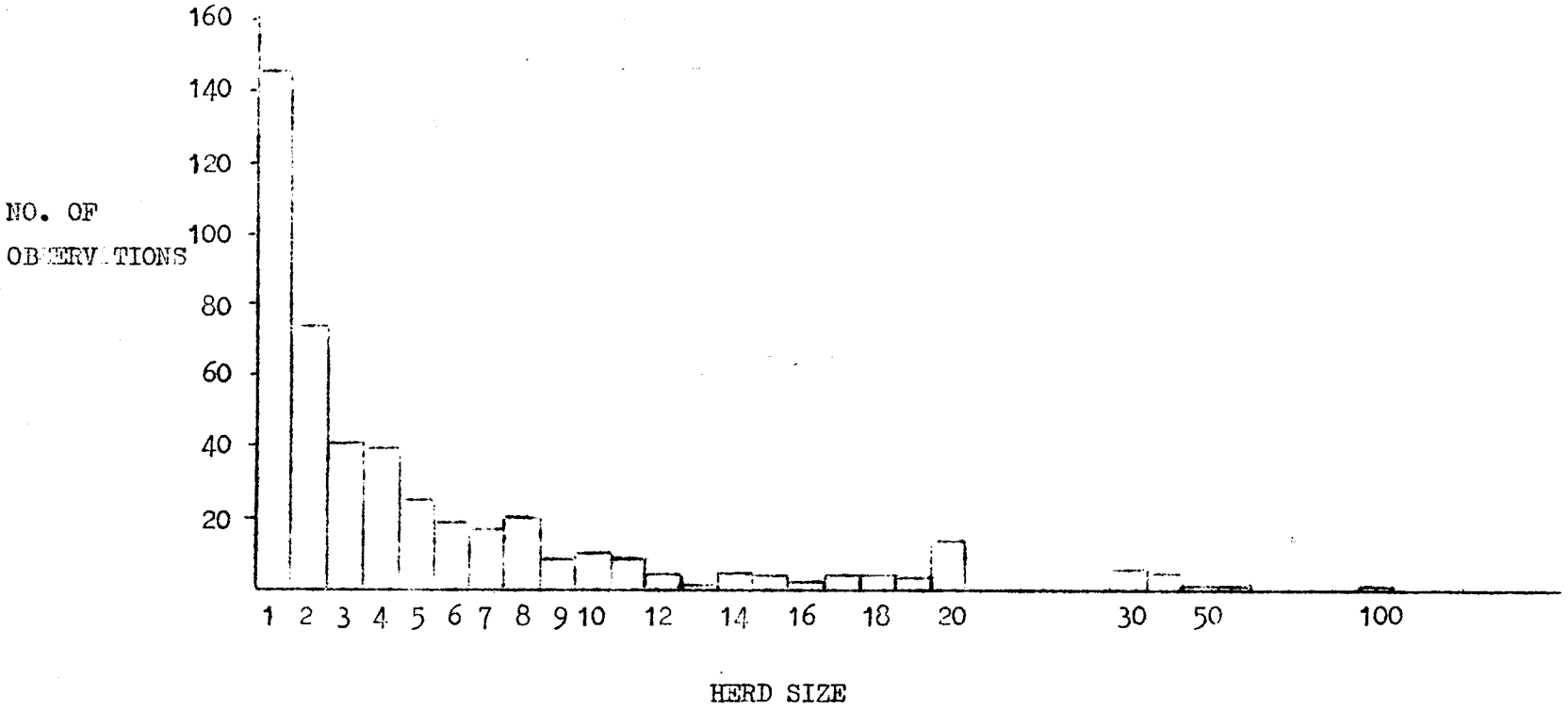


FIG. VII: GEMSBOK

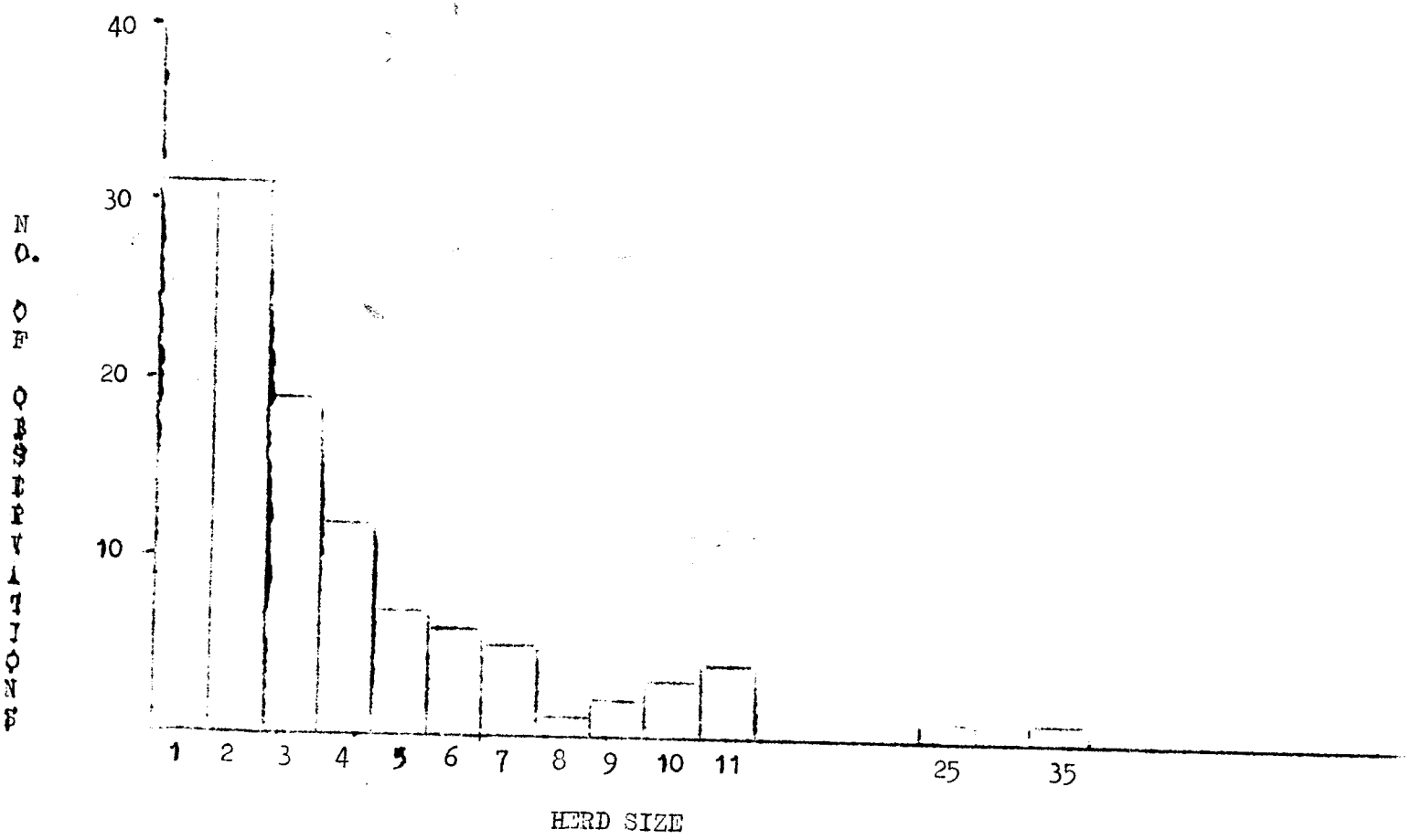
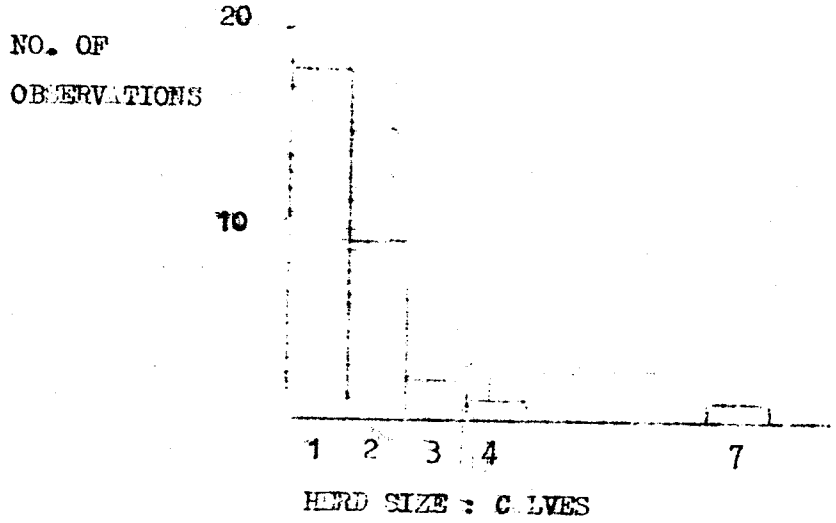


FIG. VIII: KUDU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OBSERVATIONS
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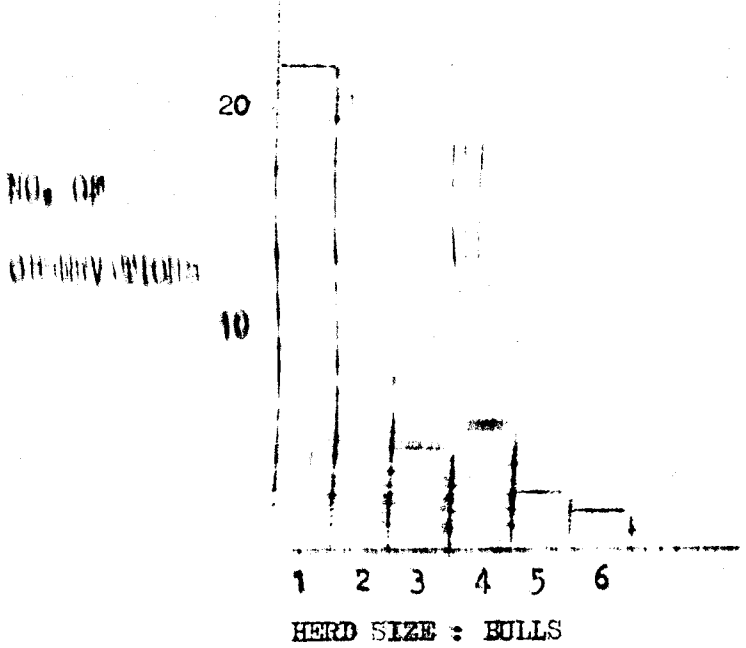
HERD SIZE : CALVES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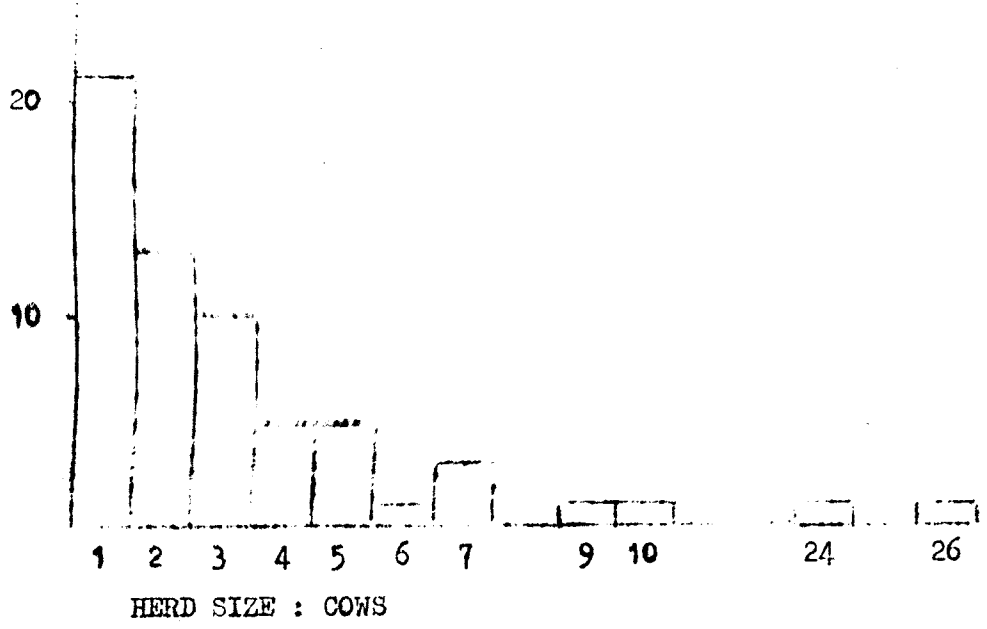
HERD SIZE : BULLS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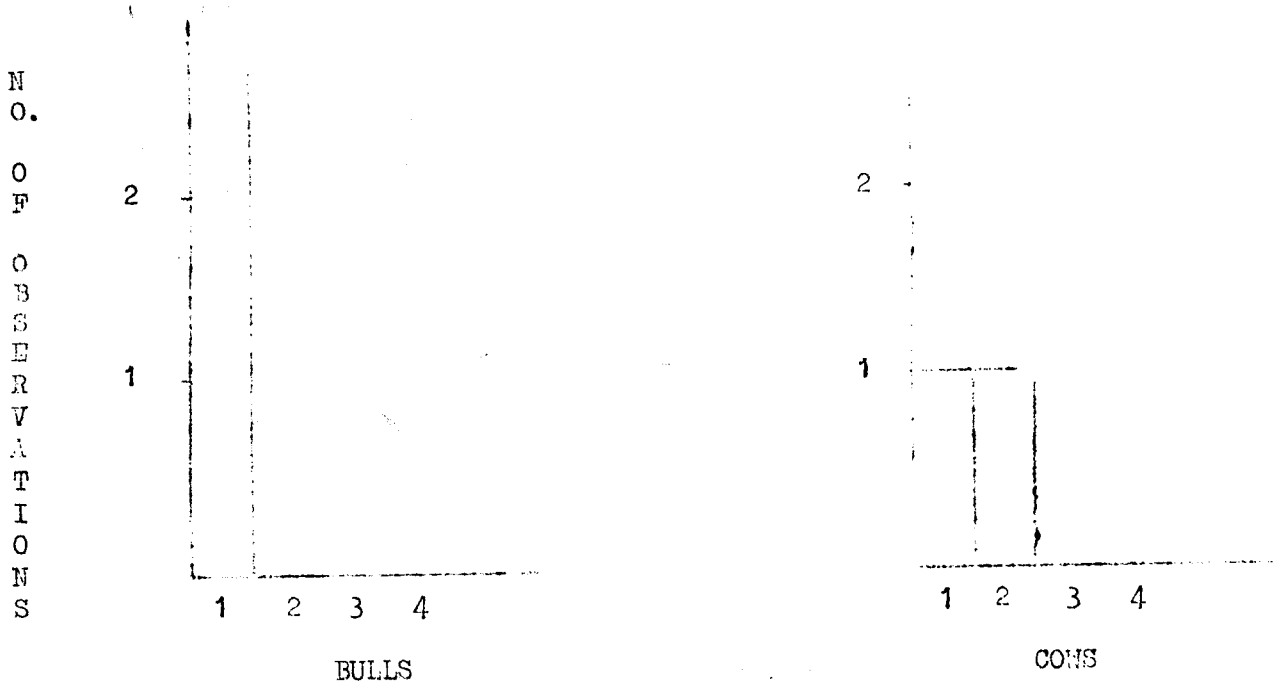
HERD SIZE : COWS



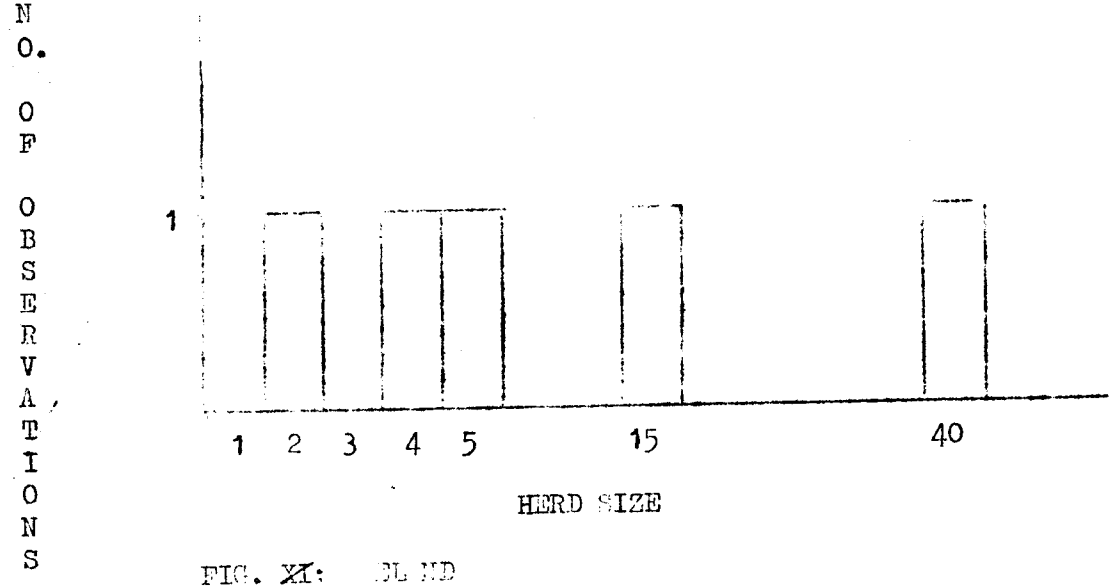


FIG. ~~XI~~ IX: BLEND

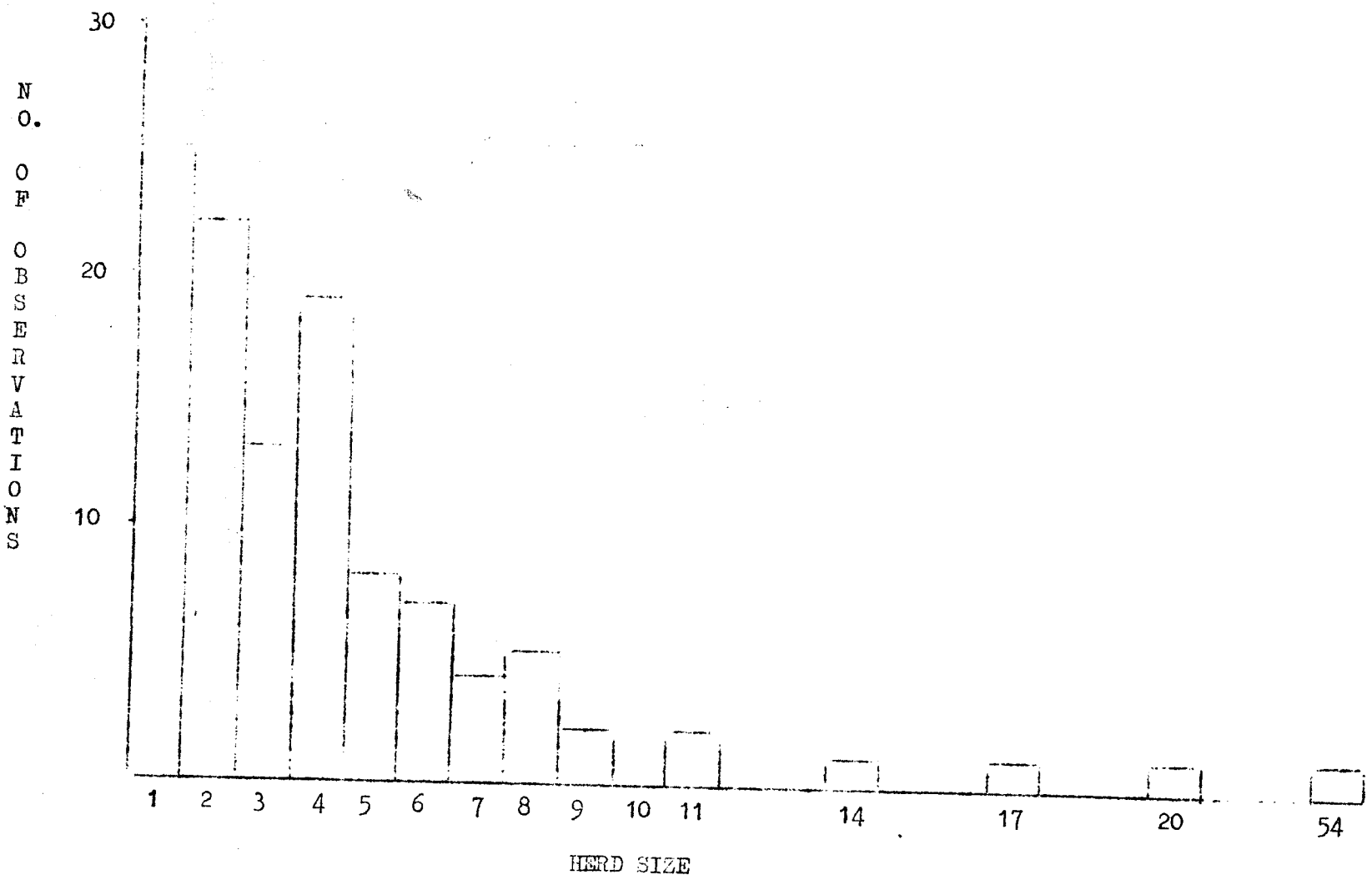
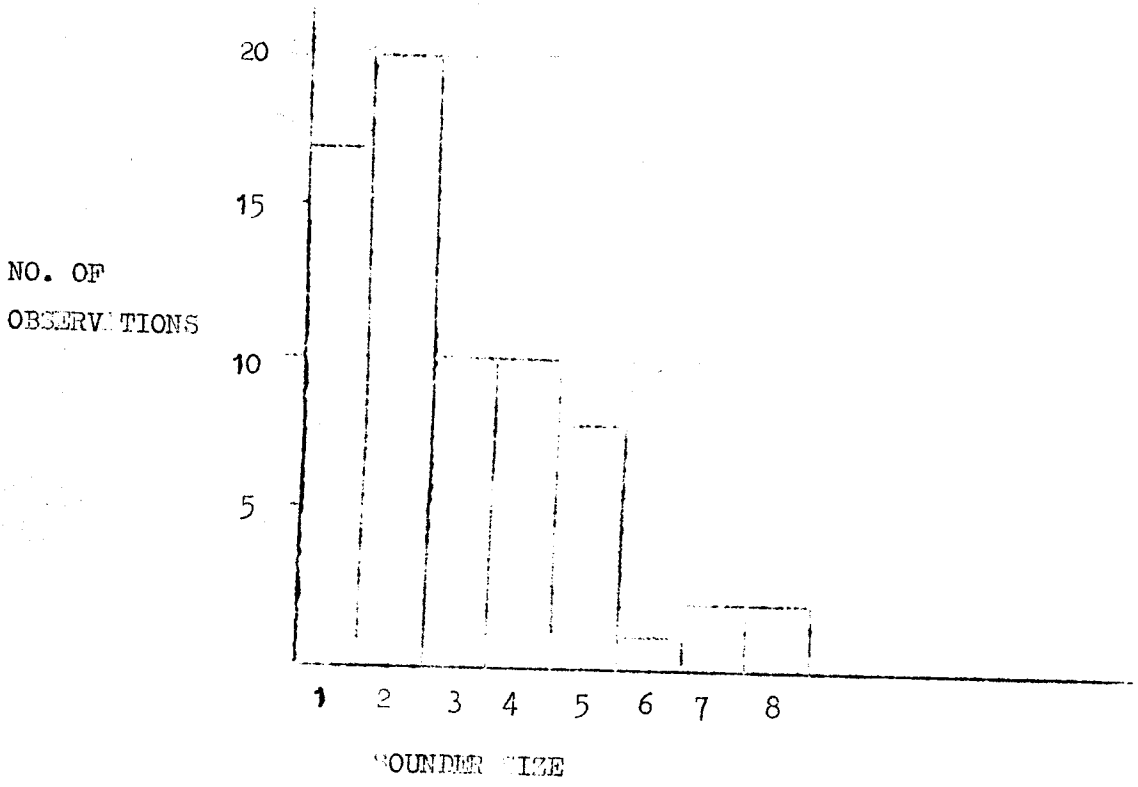
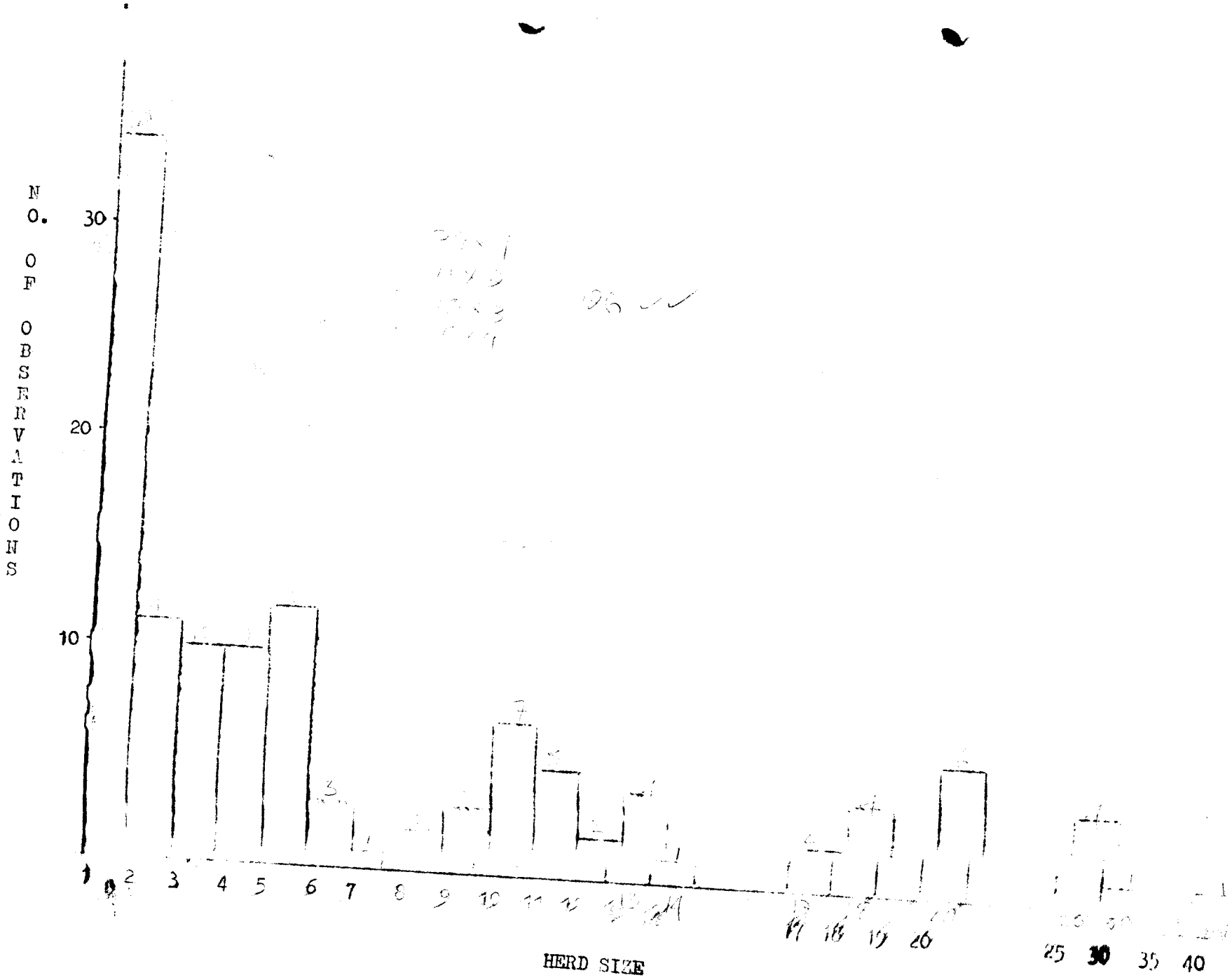


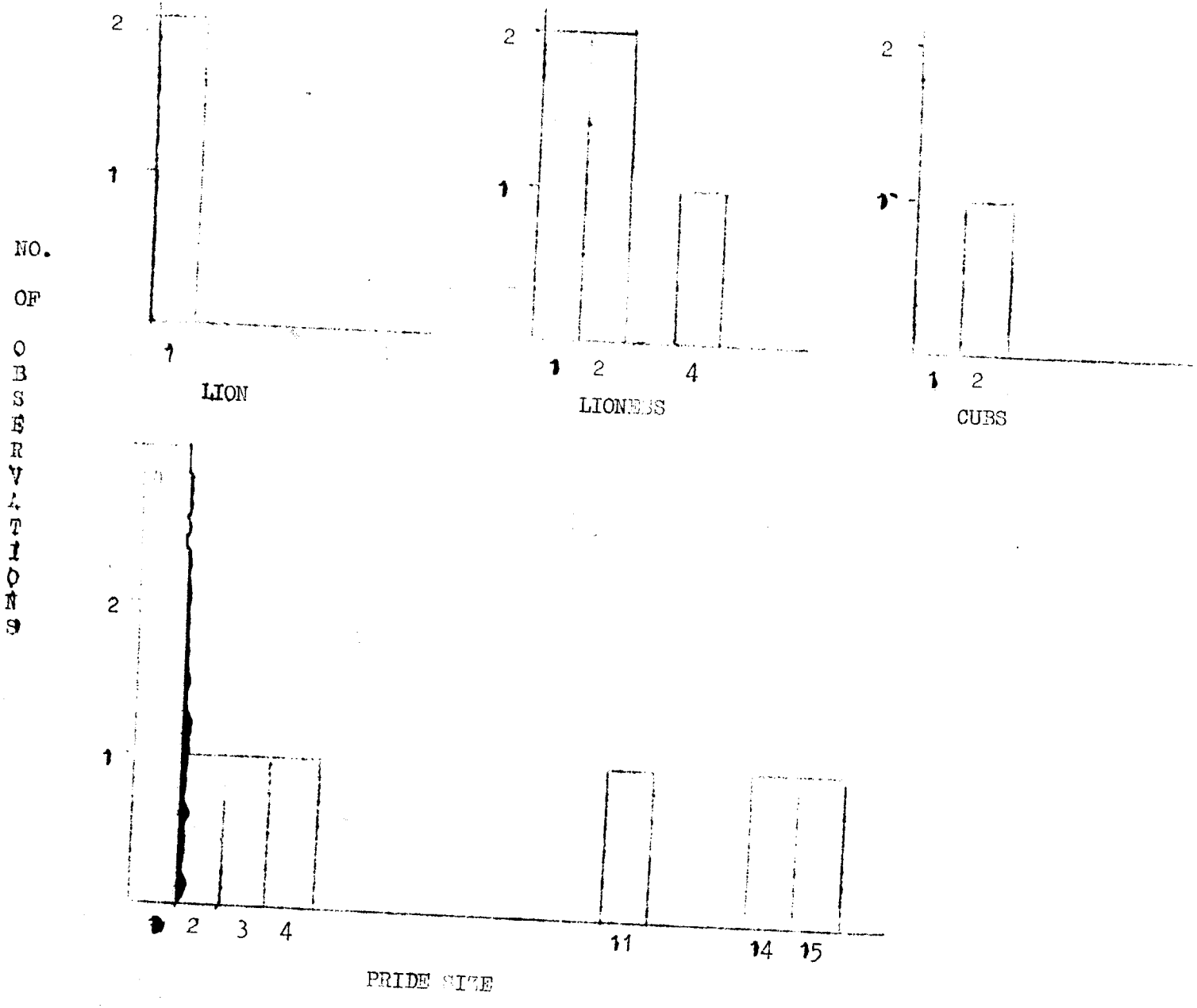
FIG. X: GIRAFFE



OUNDER IZE

FIG. XI: RTHOG


NO. OF OBSERVATIONS
30
20
10
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
25
30
35
40
HERD SIZE


NO. OF OBSERVATIONS
2
1
1
LION
2
1
1
2
4
LIONESS
2
1
1
2
CUBS
2
1
1
2
3
4
11
14
15
PRIDE SIZE

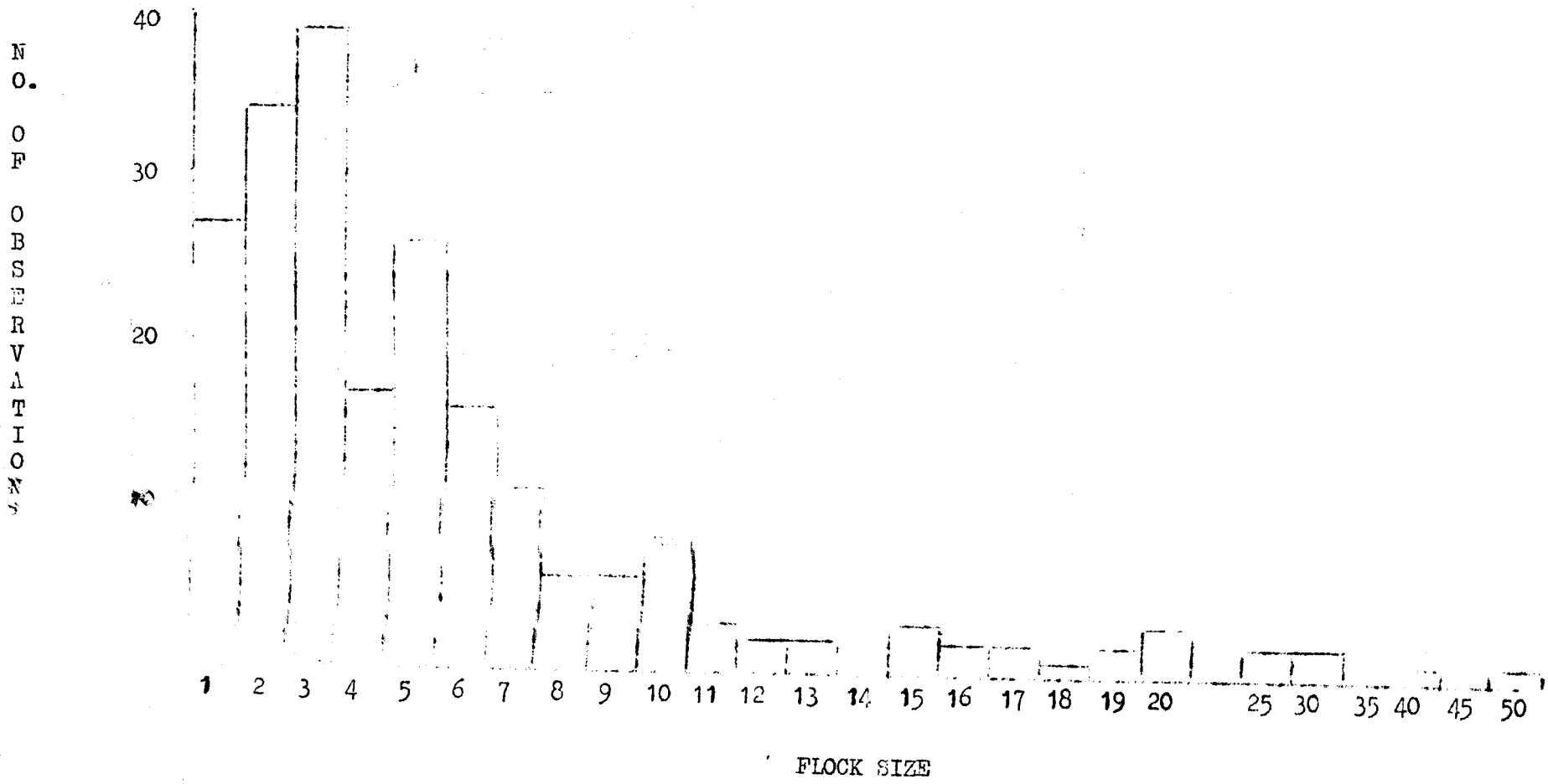


FIG. XIV: OSTRICH