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A count of large mammals in Lake Manyara National Park

(Tanzania)

Introduction

On 3 October, 1975 a simultaneous air and ground census of the large mammal populations of Lake Manyara National Park was carried out. The last comprehensive surveys had been carried out by Watson & Turner (1965) and Douglas Hamilton (1972). During recent years, it was anticipated that major changes in animal numbers would have occurred. This expectation arose from the major habitat changes that the Park has experienced during the last few years as a result of climatic fluctuations, soil erosion, changes in the lake level and extension of the Park.

Methods

Aerial and ground counts were conducted of seven large mammals: elephant (*Loxodonta africana*), buffalo (*Syncerus caffer*), hippopotamus (*Hippopotamus amphibius*), zebra (*Equus burcheli*), rhinoceros (*Diceros bicornis*), giraffe (*Giraffa camelopardalis*) and impala (*Aepyceros melampus*). The aerial count was a duplication of Watson & Turner's (1965) method; that is, flying by Super-Cub aircraft across the long axis of the Park and making alternating 'U' and 'P' turns at the escarpment and the lake shore respectively, with the observer counting out of one side throughout the flight. On the evening of 3 October, 1975, the animal count was done in the southern half of the Park, and in the morning of the next day the northern half was counted. Because of the closed canopy the aerial count was not done at the Magara extension. Counting was by eye, animal numbers being plotted on a 1 : 50 000 map. Large herds of buffalo and hippopotamus were estimated, then photographed for an accurate count. Because of their small size, impala were not counted from the air. Most of the buffalo herds were too large to make any reasonable ground estimate; so only the aerial count was considered in the eventual analysis.

The ground count was also a total count. The Park was divided into four strata based on their differences in vegetation types. Each group of recorders was allocated a stratum in which a thorough count of the animals was made.

Results and discussion

Aerial and ground count results are compared in Table 1. Aerial count results are on the low side for zebra, rhinoceros and giraffe, presumably because of the woody nature of the habitat and smaller group size of these species. Table 2 is a summary of the changes in animal numbers within the last decade. The dramatic increase in the hippopotamus population is very apparent. This could be due to river erosion and adjacent conversion of forest into grassland by floods, thereby providing a better habitat for these animals. It is also possible that hippopotamus have moved into the Park since 1970, or that they are now more visible from the air, or possibly there were errors in the previous counts.

Table 1. Aerial and ground count of large mammals in Lake Manyara National Park compared (October, 1975)

Animal	Aerial count	Ground count
Elephant	386	301
Buffalo	1823	—
Hippopotamus	151	95
Zebra	109	156
Rhinoceros	15	35
Giraffe	50	66
Impala	—	985

Table 2. Changes in large mammal populations between 1965 and 1975 in Lake Manyara National Park

Species	Animal numbers				
	1965	1969	1970	1973	1975*
Elephant	421 ‡		427 †		386
Buffalo	1507 ‡	1548 §		1793 §	1823
Hippopotamus	10 ‡		10 †		151
Zebra	115 ‡		75 †		156
Rhinoceros	20 ‡		23 †		35
Giraffe	31 ‡		60 †		66
Impala	285 ‡		451 †		985

* Highest figure from aerial or ground count.

† 1966–1970 mean or minimum numbers (Douglas-Hamilton, 1972).

‡ Counts by Watson and Turner (1965).

§ Counts by Sinclair in 1969 and 1973.

The increase in impala population is probably a result of low predation and improved habitat which has become more open. Some of the apparent changes may also be due to counting error. In 1965 there were 115 zebra in the Park (Watson & Turner, 1965); Douglas-Hamilton (1972) estimated about seventy-five animals; today there are 156. The rise in the lake level between 1968 and 1970, which eliminated more than half of the lake flats (the 'plains habitat') and made an effective barrier to animal movement between the Park and the Esmingor populations, coupled with the increased cultivation at the northern and southern ends of the Park, could account for the low zebra count in 1970. The fall in the lake level in recent years and the resultant restoration of the lost lake flats may have contributed to the recent rise in the zebra population.

The buffalo population shows a steady increase probably as a result of the increased plains habitat due to conversion of woodland into grassland by floods and by animal overbrowsing. The elephant population does not seem to have changed much. It is possible that with the deterioration of the woody vegetation in the Park, elephants make more use of the southern extension and the Marang forest reserve, especially now that access to it has been improved. The aerial count of the extension would not have shown 'missed' elephants, as they were impossible to see. However, the 101

elephants reported from the ground census (in the extension) suggest it is being intensively used, drawing off elephants from farther north. The southern extension (c. 650 ha) which has just been opened to wild game has perennial water supply and bears thick vegetation with a closed canopy. It forms an important refuge for animals, especially during dry periods.

Rhinoceros are very cryptic and cannot be seen with ease, particularly in such a woody area; thus the figure given in Table 2 is probably an under-estimate.

To summarize, although the changes in climate, especially rainfall have had a great impact on the flora of the Park, they have generally been of advantage to the animal populations, especially the plains game. The immediate future of the large mammal populations in the Park looks assured with the availability of the southern extension and the improved access to the Marang forest provided that the lake does not completely dry up.

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