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Convergence of Wild Animals at River Oli Banks in Kainji Lake National Park, Nigeria

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Abstract: The annual convergence of some wild animals at the Oli River in Kainji Lake National Park was studied. Animal population were determined using the King census method. Indirect method of counting involved the use of footprint and faecal count. Sample drives were carried out as from 7.00 h in the morning to 18 h in the evening. Data were collected both in the dry and wet seasons. There were significant differences ($p<0.05$) in animal population and distribution between the dry and wet seasons. Antelope were the most common animals while elephant were the least. Different species of birds were also sighted at different hours of the day. There was a positive correlation ($r = 0.022$) between animal visit to Oli river and the season of the year. Hippopotamus and different species of reptiles were found within the riverbanks while dicker was the least frequent throughout the year. The flooding of the river was also found to affect animal population. Oli River, the biggest river that runs across the park, is of great ecological benefit to the park. It was concluded that Oli River provides water for various species of wildlife both during the dry and at wet seasons. It also supports vegetation, which provides protective cover and food for wildlife. This greatly explains why there is a high convergence of animals at its bank all the year round.

Key words: Convergence, population, resources, seasons, canopy cover

INTRODUCTION

Concept of wildlife distribution and abundance is very important in biodiversity conservation[1]. Wildlife abundance and distribution are dependent on many abiotic factors such as soil, climate and vegetation. It also includes the effects of continuous interaction of different species of wildlife[2]. Distribution of wildlife could be attributed to its physiological adaptation to its environment (Kingdom).

Food is an important aspect of an environment, which must be present in adequate quantities for various species of animals. Animal population is utterly controlled by floral and edaphic components of a habitat. Feeding relationship is an obvious phenomenon in any community for instance, in an arable farmland, some species of wild birds were seen feeding on the arthropods and crops continuously in the dry season[3]. Moreover, Twine[4] reported that the distribution, affects the quality, of food of game animals, and determines biomass production level in an environment. Similarly, Miliner[5] reported a movement of mammals and birds to secure suitable places for breeding at dry season and as soon as the season becomes conducive they move back to their natural habitats. Montgomery[6] reported that reproductive inhibition possibly, coupled with a territorial system and dispersal, limit population growth and regulate abundance of mammals in their habitats. Environmental variation is associated with variation in density and perpetual density depends on local rules of population change.

Many methods are used world wide for wildlife population estimate with each having its own merit and demerit. It has been established that there is no perfect method for this estimate. In the same vein, Owen-Smith[7] reported that dung count gives estimate similar to those methods of population estimate for a wide range of vertebrate groups. In other words, it is as accurate as many other reliable methods known. Similarly, Whitehouse *et al*[8] reviewed various methods of estimating wildlife population and concluded that footprint and dung count are very suitable for almost all categories of wildlife population estimate.

The role of a river as a source of water for both plant and animal in a national park cannot be overemphasized. In fact, water availability is a criterion considered in the establishment of a national park. A rivers provides water for drinking, it also provides cooling effects in both plants and animals. River Ibuya and Okomu which run through the length and breath of Old Oyo and Okomu National parks respectively, account for the provision of water and shelter for over 60% of animals in the parks[9]. Similarly, Oli River which takes its source from River Niger in the Northern region runs through the whole length of Kainji Lake National park. It remains on course no matter the

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severity of the drought; it does not dry up; thus providing water for both the floral and fauna species in its vicinity.

This study, examines the pattern of wildlife convergence and seasonal distribution along Oli River in Kainji Lake National park. It is hoped that this will provide baseline a information needed in park design and management in the tropics.

MATERIALS AND METHODS

Study area: The study area is the Kainji lake National park, Nigeria. It was established in 1989.It is made up of two sectors namely: Borgu and Zuguma. It covers an area of 583Ksqm.The climate is that of a tropical West Africa. It is one of the most important National parks in Africa, as it is highly endowed with many floral and fauna resources. It has a high patronage of tourist both nationally and internationally. There is a distinct raining season from May to October with maximum rains in August and September. The vegetation is that of a typical tropical savanna. The common trees include *isoberlinia* woodland, *Burkea africana*, *Detarium microcarpum*, *termnialia* sp., *Afezlia* sp. Oli River is the major river found in the park. It takes its source from the river Niger. The river is perennial as it breaks into pools during the dry season. At this period it s surface rate of flow reduces but the pool remains and are often quite large and provide a source of water to the wildlife population. There are at least several of such pools along the river. The wet season is characterized by a period of maximum volume. The water is torrent, marked by swift flow and its volume remains like this till the end of September.

A reconnaissance survey was carried out to assess the demarcation of the riverbanks, the vegetation, length of the river and the animal species. It was also to determine the season of the year when the river is relatively more available and more utilized by wild animals.

Two methods were used for the study: They were: direct and indirect methods

Direct method: The direct involved use of king census method, which involves using a four-wheel drive moving at 40 Km h^{-1} along the Oli river bank There were two observers at each side. The observers recorded the following: number of animals species, age and time sighted. Sample drives were made along the transects from 6.0 h in the Morning to 6.0 h in the evening. The transects were 7 m in width and13 Km in length ; running through the whole length of the river. Samples were taken both at the wet and dry seasons. Wet season months were May to September while dry season were October to April. Samples were taken 3 days weekly throughout the months of study.

Indirect method: The indirect method involved counting the faeces of the different species of animals at the study area. In order to prevent double counting only fresh faeces were counted early in the mornings along the transect with the assistance of experienced game guard. Also faecal counting was done on straight direction without retuning to the areas earlier visited same day. It also involved identification and counting of the footprint of animals along the transects. Information obtained were used to estimate the number of animals present and the frequency of visit to the river Data collected were analyzed using the T test while significant differences between the means were analyzed using Duncan[10] multiple rang test.

RESULTS AND DISCUSSION

Wild animals are conscious of the situation of their environment. Table 1 shows the list of wildlife species at the dry season sighted close to the Oli River. It shows that there is a wide variety of animals moving close to the river at this period. Twine[4] also reported that an appreciable movement of animals towards the source of water at dry season in Van Reenen Bay seal colony, South Africa, in a study conducted on the variation in jackal's population. There was a positive correlation (r = 0.22) between the animals sighted at the river banks and the season of the year. The result showed a higher movement of kobs, dicker and baboons than any other animal to the river. Hippopotamus and reptiles were more easily sighted either in the river or very close to it. Although, baboons and monkeys were found close to the riverbanks they also travel long distances early in the mornings to search for food. Sometimes, the baboons travel out of the park to farms far away to harvest crops[6]. In the afternoons, baboons never forget to return to the river banks to drink water and cool their bodies but retire finally to their sleeping sites in the evenings.

The movement of animals into the riverbanks at wet season was presented in (Table 2). Few animals were recorded at the Oli riverbanks at dry season. However, reptiles especially crocodile and pythons were easily sighted. Fewer numbers of animals were sighted drinking in the river. At the peak of raining season the river often overflows its banks flooding the whole area, this probably accounts for low population of animals at this region at this period[6]. At the wet season food resources are more abundant in different parts of the park and animals do not have to converge at the river banks for vegetation for protective cover from solar radiation and predators[2].

Table 1: Animals sighted at oli river bank in the wet season

Animal species	No. of times sighted	Average estimated No.
Baboon *Papio anubis*	66	44
Duiker *Sylvicapra grimmia*	48	51
Kob *kobus kob*	35	39
Red patas monkeys *Erythyrocebus patas*	41	47
Green monkey *Cercopithecus aethiops*	32	29
Grass cutter *Thryonomys swinderianus*	38	55
Roan antelope *swinderianus*	26	34
Warthog *Phaecochoerus aethiopicus*	1	2
Water buck *Kobus ellipsiprymus defassa*	4	6
Crocordile *Crocodillus crocodillus*	30	48
Buffalo *Syncerus caffer*	4	11

Table 2: Animals sighted at oli river banks in the wet season

Animal species	No.sighted	Average estimated No.
Baboons *Papio anubis*	71	44
Dicker *Sylvicapra grimmia*	55	51
Kob *kobus kob*	44	37
Red patas monkey *Erythyrocebus patas*	54	47
Green monkey *Cercopithecus aethiops*	46	33
Grass cutter *Thryonoms swinderianus*	58	58
Roan antelope *Hippotragus equinus*	39	34
Warthog *Phaecochoerus aethiopicus*	5	2
Water buck *Kobus ellipsiprymus defassa*	2	1
Crocodile *Crocodillus crocodillus*	23	27
Buffalo *Syncerus caffer*	6	11

Table 3: Food list of animals at oli river bank

Plant resources:	Availability
Grass species	Very high
Legumes species	High
Browse species	Very high
Rhizomes	High
Roots	High
Grains	High
Flowers	High
Mushrooms	Scarce
Animal Resources :	
Insects	High
Larvae	High
Tick	High
Spider	High
Grass hopper	High
Helminthes:	
Earth worm	Scarce
Nematode	Scarce

Table 3 shows the food list of animals at the riverbanks. It was apparent that animals have a wide list of food resources to choose from. It also showed that the bank is rich in both animals and plant resources. Insect constitutes the major animal food resource while shrubs were the highest plant food[5]. It is very interesting to note that insects are available in large numbers in the park at both seasons but are more in the dry season. Insects serve as food for a wide species of wild animals and in fact, it forms the major food for birds and reptiles.

Water is a physiological need of all organisms at all times. Therefore, the presence of a river in a park cannot be overemphasized, infarct; this is a requirement for park planning and design[9]. Oli River do not dry up completely irrespective of the severity of the drought. Instead of drying up, it forms pockets of pool of water at different regions where animals could drink and cool their bodies. Montgomery[6] also recorded higher concentration of wood mouse near waterholes at drought in a study conducted at Tollymore Park Newcastle, Co. Down, Northern Ireland.

Almost all the animals were sighted having contact with the Oli River. Different activities were found to be taking place in the riverbank by the animals. Animals were scored for drinking when they touched the river with their mouths Resting was defined as sitting or standing close to the river with no other observable activity recorded at that time. Grooming was scored when animals were engaged in playing with or combing the hair of other animals in its vicinity. This also includes mating and pseudo mating. Climbing and lying on other animal were also scored. Monkeys of different species were sighted engaging in drinking and grooming especially at the dry season. Kobs and dickers were also sighted drinking and mating but were not engaged in grooming. Birds of different species were sighted drinking both at the dry and wet seasons[11]. There was a positive correlation (r=0.34) between the season and drinking in baboons. Higher rate of drinking recorded at dry season is expected as it might be connected with the physiological requirements of water by animals as a cooling agent, especially in this tropical environment[12]. Similarly Ibeawuchi and Akinsoyinu reported that animals in the tropics tends to dissipate heat due to the high ambient temperature while, their counterparts in the temperate zones absorb it due to the low temperature in their environment.

Figure 1 shows the graphical representation of the frequency of visits of animals to Oli River. It was apparent that all animals have contact with the river. Frequency of visit was higher at the dry than at the wet season. Almost all animals have to visit the river to drink. Hippopotamus and reptiles were permanently in contact with the river especially at the dry season, for breeding, protective cover, feeding, drinking or other physiological needs[13]. There was a low record of buffalo visit to the river bank during the day however, the large numbers of their faecal droppings at river bank early in the mornings shows that they were visiting the river at night or very early in the mornings before the commencement of the study.Kobs were the most frequent mammals sighted visiting the river at both the dry and wet seasons. Monkeys and baboons recorded a high frequency of visit at both seasons. Smaller mammals such as rodents visited the river least. The low frequency of visit by small mammals might be because of their body sizes which make them require less water, as animals drink according to their body sizes[14]. Moreover, the fact that most rodents live in holes, crevices and under litters of leaves makes them better protected and covered from predators and direct heat of

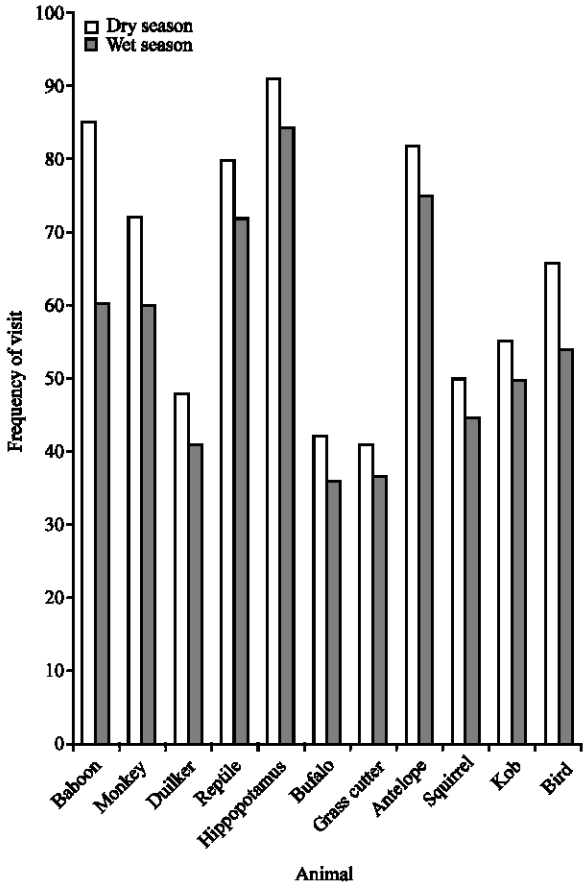

Fig. 1: Frequency of animal visit to oli river

the solar energy, hence their less requirement for water than the bigger mammals[5]. Annually, the Kainji Lake National park is burnt in the dry season for ecological reasons such as promotion of new flush which are younger and less ligninified than the older grasses and shrubs. Burning also controls parasites and vector of diseases. During burning animals migrate towards the river for protection and drinking

In conclusion, many animals were found at the bank of the Oli River in kainji Lake National park. Animas visit the river in large numbers throughout the year for drinking, protective cover, breeding, grooming and other physiological requirements. The river bank provided ever green shrubs, legumes, rhizomes, roots, fruits and grasses which serve as food for different species of wild animals. Therefore, the significance of the river to the ecological and physiological needs of the animals and the conservation programmes of the park cannot be over empherzised. It is hoped that this study will provide a baseline information for further studies in animal ecology and an enhancement of the management strategies of the park authorities.

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