POPULATION STATUS OF WESTERN HARTEBEEST (*Alcelaphus buselaphus* Pallas, 1766) IN THE ZUGURMA SECTOR OF KAINJI LAKE NATIONAL PARK

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ABSTRACT

Continuous monitoring of the size of wildlife population is a basic requirement for proper wildlife management. Therefore, this study assessed the population status of Western hartebeest (*Alcelaphus buselaphus*) in Zugurma sector of Kainji Lake National Park (KLNP) for a period of five months.. Direct method census and line transect were used to collect data from six tracks (Muleh, Abubakar Mashegu, Kawo Gate, and Felegi track). The tracks were visited for five (5) days in a month for the period of the study. Highest observation was recorded for Abubakar Mashegu track with 33.7% of observed population. Felegi track with 30.2% and the least was recorded in Kawo gate track with 17.4%. It was also observed the month of February recorded the highest number of individuals with 57 individuals follows by the month of January with 38 individuals and the month of November recorded the least with 24 individuals. Vegetation distribution of Western Hartebeest in the study area revealed that Riparian forest recorded the highest with 33.7% while *Acacia* was the least with 17.4%. The population structure of Western Hartebeest showed that male and female recorded 33.72% each and the young recorded 32.56%. The food of Western Hartebeest in the study area includes *Andropagon gayanus, Andropogan tectorum, Annona senegelensis, Gardenia aquala, Afzelia african,* and *Hyperrhenia rufa* among many others. The activity budget of the animal includes standing, walking, running, lying and grazing/browsing. The study concludes that Western Hartebeest are not evenly distributed in the Park. Although , they are distributed round all the tracks within the study area.

Keywords: Hartbeest, population, park, distribution, food

Introduction

The challenges confronting conservation of wildlife animals in Nigeria is due to a number of factors ranging from increase in human population leading to poverty, indiscriminate felling of trees both for timber and charcoal vis-à-vis illegal felling, encroachment into the forest for farmland and lastly insecurity bedeviling the national parks. Many wild animal species are becoming extinct as a result of these changes facing the animals in their natural habitats. An environmental organization called Friends of the Earth has identified Nigeria as one of the areas where tropical rain forest is being lost at the rate of over 402,000 hectares per annum. This is a serious threat to our tropical rain forest wildlife heritage (NEST, 1991). Today, the forest and wildlife (fauna and flora) is under severe pressure and the current threats to wildlife loss and the concomitant loss of their habitat is a dangerous trend that must be address. Oates and Anadu (1982) ascertain that over 20 hectares of the world's rain forest are constantly being destroyed due to uncontrolled human activities. The continuous trend will result in devastating consequences

for the rain forest. In order to address the continuous exploitation of forest resources, it requires the principle of conservation which is a systematic management of the biosphere resources with respect to human use in a sustainable use while maintaining the potentials to meet the needs and aspirations of future generations is the key (Ayodele *et al*., 1999).

This concept of conservation takes into account the wise usage and maintenance of the earth resources, with the view of managing the resources base on accurate inventory. And the need to take measures to protect the resources in ensuring that it is not exhausted (IUCN, 1986). It is also applying ecological knowledge to strike a balance between the population of fauna and flora with the need of the people (Bolen and Robinson, 1999). Several approaches can be used to manage wildlife including preservation, conservation, and management (Anderson, 1999; Anderson *et al*., 2002).

Western hartebeest (*Alcelaphus buselaphus*) is a large high shoulder, deep-chested antelope with long legs, short neck and long and narrow face. The horns vary considerably from individual to individual between 45 cm to 83 cm and from region to region. Coloration also shows considerable regional variation (red black in Kalahari, tan in East Africa, and golden brown in West Africa) (Kingdon, 1997). According to Kingdon (1997), the weight measurement of male and female varies with female weighting between 118-185 kg, and the male between 125-218 kg. Though the ecology of a threatened and endangered species may not differ among biomes of the same type of habitat for instance among birds and terrestrial animal. Their peculiarity in being threaten or endangered depends on factors confronting conservation management (Stiling, 2002).

Kainji Lake National Park was created to preserve and protect wild animals such as Hartebeest, which are present in the park and has been listed as one of the endangered species. Human encroachment into the wildlife habitat for illegal activities such as poaching has contributed to the reduction in the population of western hartebeest. In an effort to protect global biodiversity and encourage the study, restoration, and sound management of endangered species, the International Union for the Conservation of Nature and Natural Resources (IUCN) and the World Conservation Monitoring Centre (WCMC) maintain a global list of endangered and vulnerable animal species called the Red List which assesses the status of, and threats to, animal species worldwide. Also to add to this and other biodiversity databases, nongovernmental organizations such as Conservation International and World Wildlife Fund conduct periodic rapid assessments of wildlife species (Noss, 2007).

For effective conservation management of Western hartebeest in Kainji Lake National Park the population dynamics and sex ratio is important indicator. This study therefore assessed the population status of Western hartebeest in Kainji Lake National Park with the view of determining the population structure and identifies the activity time budget of Western hartebeest (*A. buselaphus*) in the study area.

Materials and Methods

Description of the Study Area

Kainji Lake National Park was established in 1979 by the amalgamation of two formal game reserves Borgu and Zugurma under decree 46 of 29th July 1997, thereby making Kainji Lake National Park the premier National Park in Nigeria. Kainji Lake National Park is located between latitude

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$9^0 45$'^{N} and $10^0 23$'^{N} and longitude $3^0 40$'^{E} and $5^0 47$'^{E}. It is made up of two sectors (Borgu and Zugurma) situated in Borgu and Kaima/Baruten Local Government Areas of Niger and Kwara State respectively. It covers a total land area of 5,340.82 sq (Ayeni, 2007).

The vegetation of the park varies from one sector to the other, Zugurma sector vegetation is typically that of the Northern Guinea savannah woodland while the vegetation of Borgu sector is transitional vegetation between the Sudan and the Northern Guinea savannah types. The vegetational distribution within the park are: Burkea/Detarium woodland, Afzelia/Isoberlinia wood land, Acacia/Anogeissus/Detarium woodland which is interspersed with patches of riparian forests along its major water courses namely Oil, Timo, Menai and Doro in Borgu sector while Manayara and Nuwa Zorugi are located in Zugurma sector of the Park (Ezealor, 2002).

The long history of conservation of the area made the park to be a home for a large pool of fauna resources among which are, Lion (*Panthera leo*),Hunting dogs(*Lycaon pictus*),Pangolin(*Maris gigantean*), Avardvark (*Orycteropus after*),Kob (*Kobus kob*), Hippopotamus (*Hippotamus amphibius*), buffalos(*Syncerus cafer*), hyena(*Crocuta crocuta*) , Baboon(*Papio anubis*), Roan antelopes(*Hippotragus equinus*),Warthhog (*Phacochoerus aethiopicus*), Oribi (*Ourabia ourebi*), Western hartebeest(*Acelaphus buselaphus*), leopard (*Panthera padus*), crocodiles(*corodalius niletucus*) etc. Birds like Secretary bird (*Saggittarius serpentarius*), White egret (*Egratta alba*), Ground Hornbill (*Bucorvus abyssinicus*), Kingfishers (*Alcedinidea spp*), Barbary Shrike (*Laniidea barbarous*), Guinea fowl (*Guttera edouardi*), Senegal Bustard (*Eupodotis senegalensis*) Lily-trotter (*Actophilornis Africana*) etc (Ayeni, 2007).

Data Collection

Direct method census was used and line transect of 40 by 40 km area were c namely Muleh, Abubakar Mashegu, Kawo Gate, and Felegi track. Data collection was carried out for a period of 5 months (November to March). Site was visited five days in every month for the period of the study. Period of visit was between 7.00 am- 10.00 am in the morning and 4.00 pm to 6.00 pm in the evening. Transects were traversed with a vehicle and on foot at approximately 4 km/hr, counting all groups of Western hartebeest seen from the transect, and data obtained was analysed using descriptive statistics.

Result and Discussion

The spatial distribution of Western hartebeest (*Alcelaphus buselaphus*) in Zugurma sector of Kainji Lake National Park are shown in table 1. Highest population was observed at Abubakar Mashegu track (33.7%). Felegi track with 30.2%, Muleh track 18.6% and the least was recorded in Kawo gate track with 17.4%. Highest number of observation were made in the February (57) followed by the month of January with 38 individuals, and the month of November with the least observation of 24 individuals. Table 2 shows that the distribution of Western hartebeest base on vegetation type was highest at the riparian forest (33.7%) and lowest at *Acacia* vegetation type (17.4%). The population structure of Western hartebeest (*A. buselaphus*) has shown in table 3 revealed that male and female recorded 33.72% each and the young ones 32.56%. From table 4 the plant that serve as food for Western Hartebeest in the study area include the following: *Andropogon gayanus, Andropogan tectorum, Annona senegelensis, Gardenia*

aquala, *Afzelia africana, Hyperrhenia rufa, Vitellaria paradoxa* among others as listed in table 4, the part of plant consumed are the leaves, stem, fruit and seed. In all the activity budget of the animal as shown in table 5, walking was the highest observation in all the tracks (30.81%) while standing was the least with 5.81% observation.

Table 1: Spatial Distribution of Western Hartebeest (*Alcelaphus buselaphus*) in the Study Area

Range	November	December	January	February	March	Total	Percentage%
Muleh	3	4	8	13	9	32	18.6
Abubakar Mashegu	8	11	14	19	6	58	33.7
Kawo Gate	9	4	5	8	4	30	17.4
Felegi	4	7	11	17	13	52	30.2
Total	24	26	38	57	32	172	100.0

Table 2: Vegetation Distribution of Western Hartebeest (*Alcelaphus buselaphus*) in the Study Area

Range	Total number sighted	Percentage%	Vegetation Type
Muleh	32	18.6	*Afzelia africana/ Isobernia doka*
Abubakar Mashegu	58	33.7	Riparian Forest
Kawo Gate	30	17.4	Acacia
Felegi	52	30.2	*Deterium microcarpum* wood land
Total	172	100.0	

Table 3: Population Structure of Western Hartebeest (*Alcelaphus buselaphus*) in the Study Area

Track	Male	Female	Young	Total
Muleh	13	9	10	32
Abubakar Mashegu	24	18	16	58
Kawo Gate	7	10	13	30
Felegi	14	21	17	52
Total (%)	58(33.72)	58(33.72)	56(32.56)	172

Table 4: Food of Western Hartebeest (*Alcelaphus buselaphus*) in the Study Area

Family Name	Scientific Name	Status	Part Utilized
Poaceae	*Andropogon gayanus*	Grass	Leaves, Stem
Poaceae	*Andropogon tectorum*	Grass	Leaves, Stem
Poaceae	*Panicum maximum*	Grass	Leaves, Stem
Poaceae	*Pennisetum polystachion*	Grass	Leaves, Stem
Poaceae	*Hyperrhenia rufa*	Grass	Leaves
Annonaceae	*Annona senegelensis*	Shrub	Fruits
Rubiaceae	*Gardenia aqualla*	Shrub	Leaves
Rubiacea	*Gardenia sokoemsis*	Shrub	Fruits, leaves
Sapotaceae	*Vitellaria paradoxa*	Tree	Seed
Caesalpiniaceae	*Afzelia Africana*	Tree	Seed, Leaves

Table 5: Activities Budget of Western Hartebeest (*Alcelaphus buselaphus*) in the Study Area

Behavior categories	Definition	Number sighted	%
Standing	Remains in the same location for at least two second	10	5.81
Walking	Leaving location while all four legs are moving in a steady pace	53	30.81
Running	Leaving location while all four legs are moving in at a very fast pace	14	8.13
Lying	One side of the stomach and torso in contact with the ground	19	11.04
Grazing/browsing	Feeding on Grasses and Leaves	25	14.53
Others	Behaviour not defined in the study	51	29.65
Total		172	100.0

Discussion

From the study, most of the animal were sighted in Riparian forest (33.7%) followed by *Deterium microcarpum* woodland (30.2%). This is because according to Mark *et al.,* (2016), habitats can have substantial influence on the distribution and abundance of animals, thus habitat that support the survival of its inhabitants will tend to have more of the animals in such location until it exceed its carrying capacity. This suggests that Western Hartebeest has more desirable factors for survival in the riparian forest and the *Deterium microcarpum* vegetation.

The spatial distribution of Western hartebeest across the tracks as well as vegetation type further revealed that the species are not evenly distributed at the Zugurma sector of Kainji Lake National park. It further reveals that the spread of abundance of Western Hartebeest is not evenly distributed in the study area. This is in line with the submission of IUCN (2001) and Saka *et al.,* (2016) that there is increasingly fragmented population of Western Hartebeest due to poaching, encroachment of farming and settlement. And

as observed by Gawaisa (2006) and Saka *et al.,* (2016) in Gashaka Gumti park, that poaching and farming activities especially around the support zone near the parks are not only posing threat to the animal themselves but are equally destroying their habitat. These will make the animal to further move away from the place that once were their natural habitat and scatter across in an attempt to locate natural habitat again. This can be one of the reasons for the spatial observation from month to month. Akinyemi and Kayode, (2011) further made this more pronounce where 40% of the respondents in Old Oyo National Park (OONP) use fire for land preparation; fire which usually get out of control and spread into the parks. What is more worrisome is the fact that 20% of the respondents by Akinyemi and Kayode, (2011) have their farmland inside the park it and 30% at the boundary of the park. This usually the scenario at Nigeria national park not to mention the banditry that has made some of the national park a haven.

The population structure is in line with the findings of Saka *et al.,* (2016) where 74.8% represented adult and 28.2% represented young showing that the ratio of adult (both male and female) western hartebeest is similar to their findings. According to IUCN (2008) that wildlife animal are sighted more during dry season than at other season, explains why more of Western Hartebeest were sighted in February than other months. The month of February is the peak of the dry season and also fire tracing must have been carried out within the Park. However, the distribution pattern of Western Hartebeest in the park indicates the animal can be found in all parts of the park but predominant at Abubakar Mashegu track that recorded high population density. The track which also coincide with it

being a riparian forest within the Zuguruma Sector.

Sex distribution of Western Hartebeest population in the study area indicates that there would be vigorous attempt for reproduction since male and female population was same. This is good for regeneration of the Western Hartebeest because of competition for female among the male.

Plant species utilized by Western Hartebeest (*A. buselaphus*) in the selected track Zugurma sector, the table revealed that Western Hartebeest (*A. buselaphus*) is a browser (browses on *Afzelia africana, Annona senegalensis*) as well as a grazer, this further support the report of Aremu *et al*, (2001) and Ejidike, and Ajayi (2013) that *A. buselaphus* feeds on both grasses and browse plant which enhances its survival in the range. *Alcelaphus buselaphus* found feeding on grasses especially *Andropogon gayanus* and *Andropogon tectorum* agrees with the statement that the animal feeds predominantly on intermediate height of mixed grasses (IUCN, 2008).

Conclusion

The result of this study reveals that Western hartebeest are not evenly distributed in the Park. Though, the study shows that they are distributed round all the tracks within the study area, there is the need for regular population census of Western Hartebeest (*A. buselaphus*) in the park and this should be conducted in every five years interval to ascertain the population status of animal for effective management policy.

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