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POPULATION DENSITY AND FEEDING BEHAVIOUR OF WESTERN HARTEBEEST (*Alcelaphus buselaphus,* Major) IN BORGU SECTOR OF KAINJI LAKE NATIONAL PARK, NIGERIA

Yaduma Z. B[1,2], Zacharia B[2], Anguruwa G. T[1]., and Shem E. M[2]

[1]Forestry Research Institute of Nigeria, Ibadan, Oyo State, Nigeria
[2]Modibbo Adama University of Technology, Yola Adamawa State, Nigeria
*Corresponding Author: *gloriaanguruwa@yahoo.com;* +2348070509852

ABSTRACT

This study focused on the Absolute Population Density, Population Structure, and Food preference of Western hartebeest in the Borgu Sector of Kainji Lake National Park. The study was undertaken to obtain information on the abundance and Population Structure as well as examine the food preferred by the species in the study area using the direct method of census and line transects established using a stratified sampling procedure. The data collected was analyzed using DISTANCE PROGRAMME 5.0. The result revealed that these species abound in each of the habitats. The density of the studied species is 1.12 individuals/km^2 with an abundance of 6.000 and an effective strip width (ESW) of 60.00 m. This further revealed that the number of Adults outnumbered the sub-adult and juvenile and males more than females while the animal is more of a grazer with high preference on Andropogon gayanus. It was observed that poaching, loss of habitat and disturbance by cattle were the major environmental challenges threatening the survival of the species. Intensive anti-poaching patrols and public enlightenment should be adopted and recommended in other to address the environmental factors militating against the survival of western Hartebeest.

Keywords: Population structure, Feeding behavior, Hartebeest, Borgu

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INTRODUCTION

Population estimates of wild animals provide basic information on the success of a particular animal in a given ecosystem. The knowledge of population helps in habitat assessment for management purposes, especially in protected areas like national parks, game reserves and their equivalents. Furthermore, the goal of global mammalian species assessment is to consolidate available information on the systematic distribution, habitat requirement, ecology, life history and conservation status of mammals (Thomas, *et al*., 2009). In Nigeria, many wild animal species are becoming extinct as a result of changes 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 wildlife heritage (Nigeria Threatened Environment-NEST, 1991).

According to Dunn (1999), wildlife biological diversity encompasses all species of mammals, birds (Aves) reptiles, amphibians, the ecosystem and ecological processes. Among the mammals are the ungulates i.e. animals with hooves, either even-toed or odd-toed. Most of these ungulates are grazers feeding almost entirely on grasses. Western hartebeest (Kanki) is an even toed (artiodactyls). It is easily identified by its characteristic horns. The hartebeest is a large savanna antelope which at first glance appears strangely misshapen and less elegant than other antelopes (Dunn, 1999). They are more tolerant of high grass and woods than other Alcelaphines (IUCN, 2008). They are of the family Bovidae (Order Artiodactyla), found in herds on open plains and scrublands of sub-Saharan Africa. They often mingle with herds of zebras or of other antelopes. Hartebeests stand about 1.2m (4 feet) at the shoulder. The backs slope downward from heavy forequarters to narrow hindquarters, and their long faces are accentuated, in both sexes, by ringed, lyre-shaped horns that are united at the base (Encyclopedia Britannica, 2009).

Population structure is a component of the environment for the members of the population and provides information that affects individual physiology and behavior, hence fitness (http//www.sciencedirct.com). Population structure (Age class) in fisheries and wildlife management is a part of population assessment. Age class structures can be used to model many populations including trees and fish. This method can be used to predict the occurrence of forest fires within a forest population (Wagner and Van, 1978).

Diet selection in wildlife is driven by the quantity and quality of available food in consonant with the nutritional needs of the animal. For instance, Coyotes are carnivores adapted to eating small animals (mice, voles, etc.) during most of the year. However, when insects, fruits, and berries are abundant in summer, as much as 80% of a coyote's diet will consist of these food items, (Greg-Smith, 2009). The demands of the animals are ultimately met with food from the environment. These demands include the maintenance of body tissue followed by the genetic programme of the species throughout the life of each individual. Life history patterns reflect the allocation of energy and nutrients required for survival, growth, and reproduction. The transfer of nutrients and energy from the environment to the wild animals is reflected in the chemical composition of materials from the soil through plants to herbivores, omnivores, and predators (*http://wwwspringer.com,* 2013). The preference of these diets is probably related to the presence of awns, spines, hairiness, position of leaves, and stickiness texture, but the ultimate determinant of preference is the plant characteristics that stimulate a selective animal response. Presumably, chemical composition is the most important factor in their diet selection. Although the bovids are herbivores, they occasionally supplement their diet, and feeding strategies are correlated with body size. Preference may be expressed in terms of proportionate time an animal spends grazing different species, (Fay *et al.,* 2007).

According to Stilling (2002), the abundance and distribution of threatened and endangered species such as hartebeests differ among biomes, for instance, threatened birds and animals occupy the same type of habitat, although with little differences. Kainji Lake National Park was created to preserve and protect most wild animals such as hartebeest which are present in the Park. Human encroachment into the wildlife habitat for illegal activities such as poaching has been contributing to the reduction in the population of western hartebeest. The solution therefore is embracing preservation, maintenance, sustainable utilization, restoration, and enhancement of the natural environment. These will go a long way in checking the rate of environmental deterioration and loss of wildlife habitat which all play significant roles in sustaining the animals' population.

It is also important that comprehensive information on wildlife resources of the country will enable one to determine the species that need urgent attention; it will also enable the government to plan for the general management of the species to boost game meat and sustainable utilization of the resource for various purposes. Hence, the need for this study.

MATERIALS AND METHODS

Study Area

Location of the Study Area

The study was carried out in Kainji Lake National Park (KLNP), which is located between Latitudes 9° 20' 0'' N and 10° 40' 0'' N and Longitude 3° 40' 0'' E to 5° 20' 0'' E (Figure 1). The Park was established in 1979 by the merger of two former Game Reserves, Borgu Game Reserve and Zurguma Game

Reserve. The two sectors had been gazetted in 1962 and 1971 respectively as game reserves by the then Northern Regional Government.

Borgu Sector is located between the Latitudes 9° 40' 0" N to 10º 20' 0" N and Longitude 3° 40' 0" E to 4º 20' 0"E in the North West central part of Nigeria between Niger and Kwara States, with a total area of 3,970km^2 (Marguba, 2002) (Figure 2).

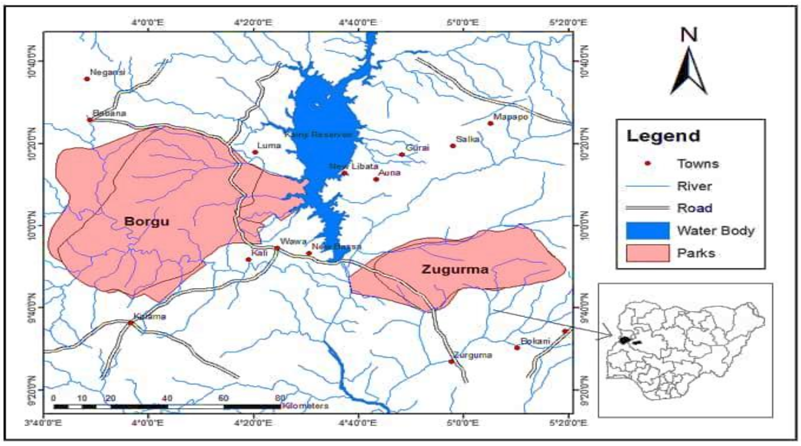

Figure 1: Map of Kainji Lake National Park
Source: (Marguba, 2002)

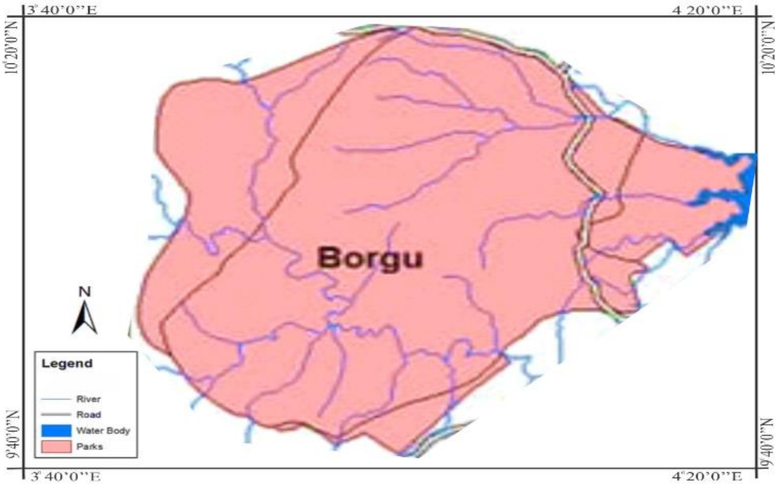

Figure 2: Map of Borgu Sector of KLNP
Source: (Marguba, 2002).

Study Design

Reconnaissance Survey

Prior to the detailed survey, the Borgu Sector of the Park was visited to assess the types of vegetation existing in the study area. The preliminary investigation led to the subdivision of the entire study area into various vegetation zones and species associations. Six vegetation zones or sub–zones were identified containing the animal species under study. The visit further led to the determination of the distribution of the Western hartebeest (*Alcelaphus buselaphus, major*) population in the different habitat/ vegetation types and their feeding sites identification of some other existing mammal species in the study area.

Establishment of transects in the habitat types of the study area

Six (6) Transects of 5km in length each were laid in the study area, a transect was laid in each habitat type. Bukar Shuaib/ *Isoberlina* mixed woodland**,** Hussaini Mashi/ *Isoberlina tomentosa* woodland**,** Kali *Burkea Africana Detarium micocarpum wooded savannah***,** Olusegun Obasanjo/ *Isobelia*, *Afzelia* mixed woodland, Shehu Shagari/ Riparian forest, and Mamudu Lapai/ *Afzelia africana* woodland.

Data Collection Techniques

Western hartebeest population census

Information on the Western hartebeest population census in the study area was determined during the census from March to August 2019. The King's census technique as described by Anderson *et al*. (2001) and adopted by Akosim (2007) as well as Gawaisa, (2010) was adopted for the census. This method involved the researcher and his assistant walking along transects. *Alcelaphus buselaphus* sighted on both sides of transects were recorded. Equally, the information on the population structure of the species was determined along the established transects. The number of sighted (adult males, adult females, sub–adult males, sub-adult females, juvenile males, and juvenile females) animals were noted and their frequencies/ percentages were obtained following Gawaisa, (2010) pattern. There were two censuses per day; one in the morning from 6:00 a.m. to 11:00 a.m., one in the evening from 4:00 p.m. to 6:00 p.m. when the animals are most active. The sighting distance from the observer to the animal was recorded. The perpendicular distance from the transect to the animal sighted was also recorded. Habitat/ vegetation type, time of sighting, and animal number were recorded. Number of males, females, young and adults sighted as well as the feeds were also recorded following the pattern of Gawaisa, (2010).

Determination of food types and preference of Western hartebeest

The direct observation method as described by Kwaga *et al*, (2017) was adopted. The researcher used binoculars to observe the Western hartebeest at their feeding sites which was also followed by on-site inspection of the plants utilized by the animal for identification. Preference ranking was done using the frequencies of the utilization of the different species and time spent feeding on each preferred species of forage.

Statistical Analysis

Estimation of Population Census

(i)The king's census formula was used for the analysis of Western hartebeest population density using DISTANCE Program 7.3 software package. The formula is stated as follows:

$D=\frac{n}{2L\hat{r}}$. ……. (1)

Where

D=Density'

n=Total number of individuals of Western hartebeest encountered.

L= Length of the transect cut and

$\hat{r}$= Average sighting distance (Anderson *et al.*, 2001).

(ii) Calculation of standard error of the mean.

Standard Deviation ($\overline{X}$) = $\sqrt{\frac{\sum_{k=1}^{n}(x_k-\mu)^2}{n}}$ ….

(2)

Standard Error (S.E) = $\frac{\sigma}{\sqrt{N}}$ (Soper, 2015)

S = Standard deviation and σ = Standard error of the mean.

Food preference ranking

Food preference ranking was determined using the formula:

$P=\frac{x_{i-t}}{y_{i-t}} X \frac{100}{1}$ …… (3)

Where x_{i-t} = number of times a species was fed on

y_{i-t}= total number of times all the species were fed on.

The values of food preference calculated were ranked according to their order of magnitude (Joyle, 2014).

ANOVA for Western hartebeest population in different habitats

A one-way analysis of variance was used to determine if significant differences occurred in the abundance of Western hartebeest in the different habitat types in the study area. The assumptions and statistical model are as follows:

a) The treatment and environmental effects are additive. This implies that the treatment effect is the same for all experimental units and that the environmental effect is the same for all treatments.
b) The experimental errors are randomly, independently, and normally distributed about zero mean and with a common variance.

Statistical Model

$Y_{ij} = \mu + T_j + E_{ij}$ ……(4)

Where,

Y_{ij} = individual Western hartebeest observed

μ = general mean (i.e the mean of the hartebeest population observed)

T_j = effect of the *j*th Treatment i.e habitat types (Woodland, Grassland, Riparian forest and Rocky area). This means that the number of treatments are (6). E_{ij}= Experimental error containing all uncontrolled sources of variance, as adopted by (Enubuse, 2018).

RESULT

Population Density of Western Hartebeest in the Study Area

The result Table 1 indicated that the absolute population density of Western hartebeest is 1.12 individuals/km^2 with a percent coefficient of variation of 38.49 and confidence interval of 0.58 - 2.47 and an estimate of several animals in a specified area to be 6.000.

Empirical Distribution Function (Detection Fct/Global/Plot: Qq-plot) of Western hartebeest in the Study Area

Frequency distribution of sightings or Detection probability of perpendicular distance of Western hartebeest shows that sightings of animals on or close to the transect are more frequent than sightings along the perpendicular distances especially far away from the transects (Figure1). While the result of the empirical distribution function in Figure 2 on level of accuracy of sightings along transects shows more detection of animals close to the transect line at the beginning and end of the transect which proves that sightings are more accurate at the beginning and end of transects than the middle

Table 1: Population Density of Western hartebeest (No/km^2) in Kainji Lake National Park

Parameters	Point Estimate	Standard Error	Percent Coef. of Variation	95% Confidence Interval	
A(1)	0.1000E+07	0.1701E+15			
f(0)	0.16667E-01	0.34019E-02	20.41	0.99151E-02	0.28016E-01
p	1.0000	0.20412	20.41	0.59491	1.0000
ESWD	60.000	12.247	20.41	35.694	100.86
DS	0.23810E-01	0.71143E-02	29.88	0.12405E-01	0.45699E-01
E(S)D	50.267	9.0551	18.01	31.752	79.576
D	1.1968	0.41758	34.89	0.58028	2.4684
N	6.0000	2.0934	34.89	3.0000	12.000

*Key: A(I) = i-th parameter in the estimated probability density function(pdf); f(0) = 1/u = value of pdf at zero for line transects; p = probability of observing an object in defined area; ESW = for line transects, effective strip width = W*p; D = estimate of density of animals; N = estimate of number of animals in specified area;*

Source: Field Survey, (2019)

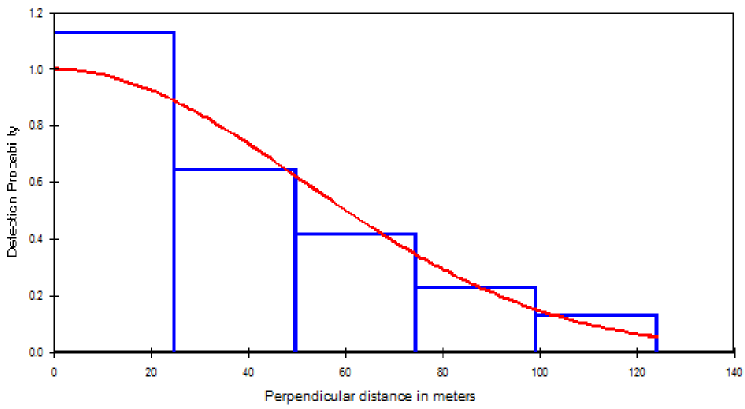

Figure 1: Detection Fct/Global/Chi-sq GOF Test 1

Source: Field Survey, (2019)

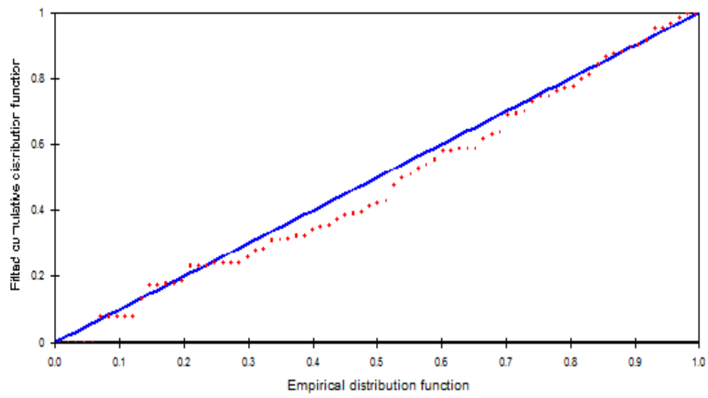

Figure 2: Level of Accuracy of Sightings Along Transects. Detection Fct/Global/Plot: Qq-plot. Source: Field Survey, (2019)

Population Structure of Western Hartebeest in the Study Area

The results of the findings of the population structure of the species (Table 2) in the study area indicated the total number of the species sighted stands at 296. Out of these, Adult males were sighted more with a population of 87; Adult females had a total number of 81 while Sub adult males and females were 29 and 33 respectively. The male juvenile population stood at 36 while that of the female juvenile was 30.

Table 2: Showing Population Structure of Western Hartebeest

S/N	Adult		Sub Adult		Juvenile		Total	
1	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
2	87	81	29	33	36	30	296	

Source: Field Survey, (2019)

Sighting of Western Hartebeest According to Transects/ Vegetation Zones

The result of the findings of Sighting of Western Hartebeest According to Transects/ Vegetation Zones or population distribution of the species (Table 3) shows sightings of Western Hartebeest according to transect/vegetation zones. Out of the total number of 296 sighted, more number of the species were sighted, 93 at Olusegun Obasanjo track/ *Isobelia, Afzelia* mixed woodland, followed by Mamudu Lapai track/ *Afzelia* africana woodland 49 at Hussaini Mashi track/ *Isoberlina tomentosa* woodland, 39 at Shehu Shagari track/ Riperian vegetation, 39 at Bukar Shuaib track/*Isoberlina* mixed woodland and 20 at Kali track/ *Burkea africana - Detarium micocarpum wooded savanna* and 56 at Mamudu Lapai track/ *Afzelia* africana woodland in that respective order. Figure 3 shows the percentage of Western hartebeest sighted According to Jeep Tracks. Olusegun Obasanjo track had the highest population at 31% while Kali track had the lowest population at 7%.

Table 3: Sighting of Western Hartebeest According to Transects/ Vegetation Zones

S/N	Transect	Vegetation Zone	Number Sighted	%
1	Bukar Shuaib	*Isoberlina* mixed woodland	39	13.18
2	Hussaini Mashi	*Isoberlina tomentosa* woodland	49	16.55
3	Kali	*Burkea africana - Detarium micocarpum* wooded savanna	20	6.76
4	Olusegun Obasanjo	*Isobelia, Afzelia* mixed woodland	93	31.41
5	Shehu Shagari	Riparian forest	39	13.18
6	Mamudu Lapai	*Afzelia africana*	56	18.92
	Total		**296**	**100**

Source: Field Survey (2019)

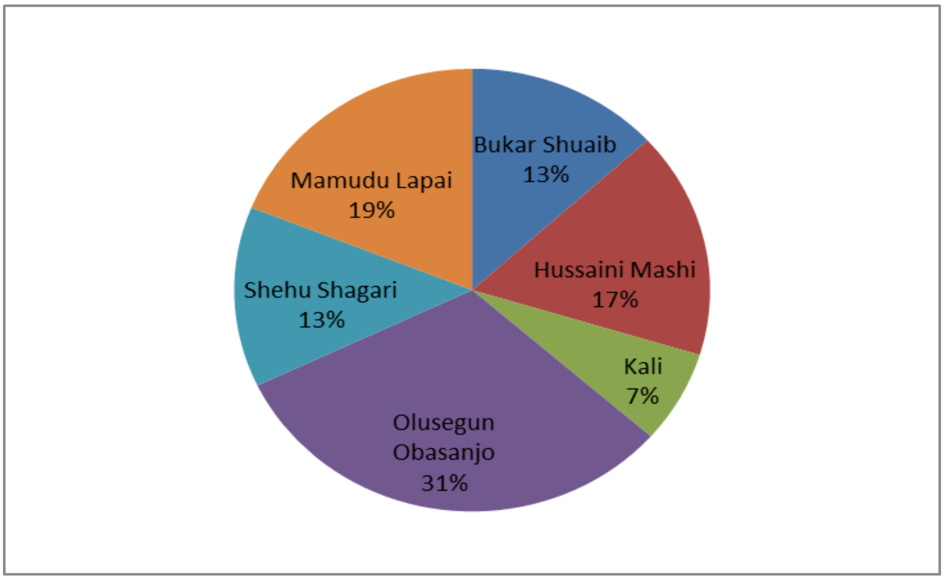

Figure 3: Pie Chart Showing Western Hartebeest Sighted According to Jeep Tracks/ Vegetation Zones. Field Survey, 2019

Sighting of Western Hartebeest According to Months

The sighting of western hartebeest according to months in this study (Figure 4) showed that the month of March has the highest number of sightings at a decreasing order to August. This explains that sighting of the species is more common in the dry season than the rainy season and this is not unconnected with the fact that the vegetation cover which is less in the dry season has aided visibility. Lack of enough food during the period would have also been a reason for the random movement of the animals in search of forage.

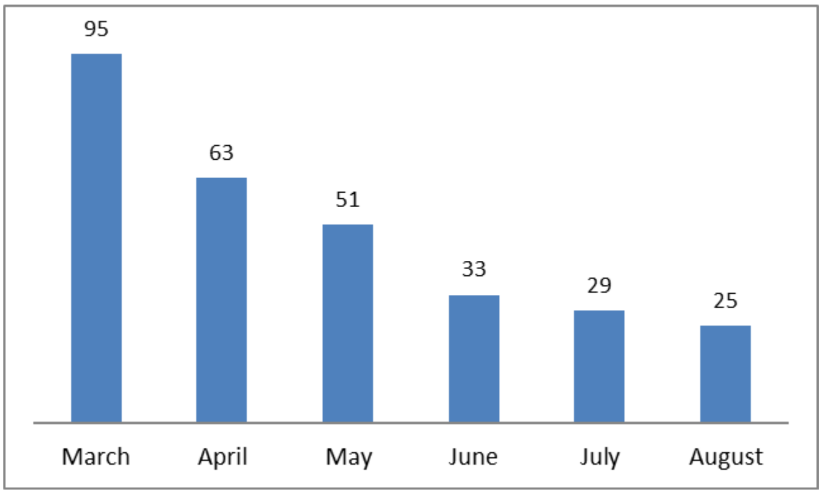

Figure 4: Bar chart showing Monthly *Sighting of* Western hartebeest.
Field Survey, 2019

The activities performed by Western hartebeest in the study area

The activities performed by Western hartebeest in the study area (Figure 5) show that the animal spent more of its time feeding than running, resting, mating, walking, and Standing. The analysis of variance result shows that there is no significant difference in the distribution of Hartebeest among transects. This indicates that the animals are widely and evenly distributed in the park (Table 4).

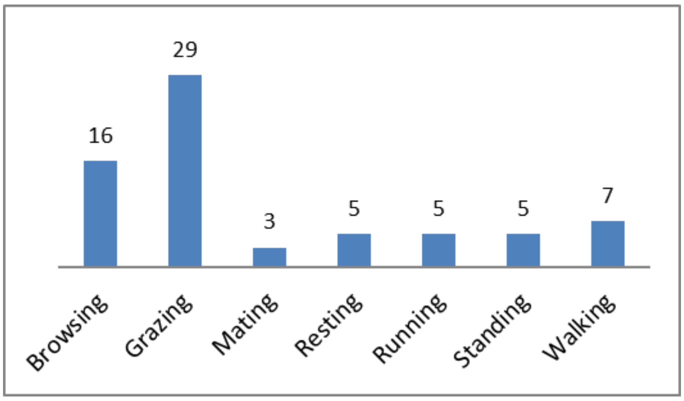

Figure 5: Bar chart Showing Activities of Western Hartebeest at Times of Sighting
Field Survey, 2019

Table 4: ANOVA for Transects/ Vegetation types

Source of Variation	Df	SS	MS	F	P-value
Between Vegetation Zones	5	22.70043	4.540085	0.855127	0.516004
Error term	66	350.4107	5.309253		
Total	71	373.1111			

**=significant while ns=not significant: ($p < 0.05$).*

Food type and plant parts preferred by Western hartebeest (Food Preference Ranking)

The result of the findings in Table 5 shows that out of the 46 times of feeding, 29 were spent feeding on grasses while 17 were spent on browsing. Grazing was found to dominate browsing in their food type selection while they are found to feed on leaves of stems of grasses during grazing but feed on leaves, fruits, and seeds during browsing. They are therefore termed as grazers. *Andropogon gayanus* had the highest frequency of utilization of 7, at 15.22 percent utilization and the 1st in ranking followed by *Panicum maximum* with a frequency of 5, at 10. 90% and 2nd in ranking while *Andropogon tectorium, Hyperrhenia dissolute, Sateria barbata* had frequencies of 4 at 8.70% and 3rd preference ranking. *Pennisetum poystachium, Vitellaria paradoxa, Combretum molle* and *Annona senegalensis* had frequencies of 3 each at 6.52% and 4th in ranking while *Hyperrhenia rufa, Piliosigma thoningii, Gardenia aquala* and *Gardenia sokotoemsis* had frequencies of 2 each at 4.35% and 5th in ranking and *Anogeisius leiorcarpus* with *Afzelia africana* had frequencies of 1 each at 2.17% and 6th in ranking.

Food Preference of Western hartebeest according to food class

The result of Food Preference of Western hartebeest according to food class (Table 6) shows feeds more Grasses (Grazing) than Trees and Shrubs (Browsing). This reveals that the specie prefers grazing to browsing and as such could be categorized more as grazers. They are found to feed on leaves and stems of grasses during grazing but fed on leaves, fruits and seeds during browsing.

Table 6: Food Preference of Western Hartebeest According to Food Class

S/N	Activity	Class of Feed	Frequency	Percentage
1	Browsing	Tree/Shrub	17	36.96
2	Grazing	Grass/Forb	29	63.04
	Total		**46**	**100%**

Field Survey, 2019

Table 5: Species and Plant Parts Fed Upon by Western hartebeest

S/N	Family Name	*Scientific Name*	Common Name	Status	Part Utilized	Frequency of Utilization	Percentage Utilization (%)	Preference Ranking
1	Poaceae	*Andropogon gayanus*	Gamba garss	Grass	Leaves, stem	7	15.22	1
2	Poaceae	*Andropogon tectorium*	Giant blue stem	Grass	Leaves, stem	4	8.70	3
3	Poaceae	*Panicum maximum*	Guinea grass	Grass	Leaves, stem	5	10.90	2
4	Poaceae	*Pennisetum poystachium*	Feathery	Grass	Leaves, stem	3	6.52	4
5	Poaceae	*Hyperrhenia rufa*	Thatching grass	Grass	Leaves, stem	2	4.35	5
6	Poaceae	*Hyperrhenia dissolute*	-	Grass	Leaves, stem	4	8.70	3
7	Poaceae	*Steria barbata*	Bristly foxtail grass	Grass	Leaves, stem	4	8.70	3
8	Caesalniaceae	*Azelia Africana*	Counter wood	Tree	Leaves, seeds	1	2.17	6
9	Caesalniaceae	*Piliostigma thonningii*	Cap stigma	Shrub	Leaves, Pod	2	4.35	5
10	Sapotaceae	*Vitalaria paradoxa*	Shea butter	Tree	Seeds, fruits	3	6.52	4
11	Combretaceae	*Combretum molle*	-	Shrub	Leaves	3	6.52	4
12	Rubiaceae	*Gardenia aquala*	-	Shrub	Leaves	2	4.35	5
13	Rubiaceae	*Gardenia sokotoemsis*	-	Shrub	Leaves, Fruits	2	4.35	5
14	Annonaceae	*Annona senegalensis*	Senegal annona	Shrub	Fruits	3	6.52	4
15		*Anogeisius leiorcarpus*	-	Tree	Leaves	1	2.17	6
Total						**46**	**100**	

Field Survey, 2019

DISCUSSION

The density and abundance of these species from this study are comparatively lower than results from previous surveys in the study sites. However, this finding is contrary to the result of (Fingesi and Oladebo, 2017) which had a density of 21.169 individuals/ km^2. This variation can be attributed to the high influx of cattle grazers in the Park which had probably led to migration by the animals. Considering the way pastoralism is being practiced in the developing world, whereby large herds of cattle are moved in an irregular pattern in search of fresh pasture, there is an increased probability that livestock herders select the same habitat as the wild grazers for their livestock (Schieltz and Rubenstein, 2016). Hence, large ungulates are likely to be present where domestic cattle are found. This interaction between wild and domestic species will increase competition for resources and could cause wild populations to decrease.

The rate of poaching particularly in Kali area could also be a reason for this dramatic decrease of the specie's population density. Other factors could be predation, famine, death due to diseases as well as the limited period of the survey. These lower densities and encounter rates suggest a decrease in populations whereby species that are encountered increasingly infrequently (where once they were common) may be in danger of extinction (Scholte, 2011).

Empirical distribution function (Detection Fct/Global/Plot: Qq-plot) of Western hartebeest in the study area agrees with the findings of Gawaisa; (2010). The level of accuracy of sightings of the species along the beginning and end of transects than the middle agrees with that of Gawaisa; (2010). On the other hand, Level of accuracy of sightings along transects is contrary to the result of Fingesi and Oladebo, (2017) in a similar study and the same study area but agrees with the findings of Gawaisa, 2010 in a different study in Ngel Nyaki Montane Forest and also contrary to a similar study in Gashaka Gumti National Park by Saka, *et al*, (2015).

The result of population structure of Western Hartebeest in the study area is in agreement with that of Adeola, *et al*, (2018); Saka, *et al*, (2015) but are contrary to those of Yisehak *et al*., (2007) in a separate study. Sighting of Western Hartebeest according to transects/ vegetation zones indicated that species are not evenly distributed in the study. The finding in this study partially agrees with that of (Fingesi and Oladebo, 2017) but is contrary to that of Saka, *et al*, (2015). While sighting of Western Hartebeest according to months This explains that sighting of the species is more common in the dry season than the rainy season and this is not unconnected with the fact that the vegetation cover which is less in the dry season has aided visibility. Lack of enough food during the period would have also been a reason for the random movement of the animals in search of forage.

The wet season as evident in the table revealed that fewer animals (Western hartebeest) were sighted in the months of June, July, and August. This could be attributed to vegetation cover and abundance of food and water at close ranges. The finding here agrees with that of (Fingesi and Oladebo, 2017) but is contrary to that of Saka, *et al*, (2015). It was discovered that the activities performed by Western hartebeest was more of feeding than running, resting, mating, walking, and Standing. However, it is also shows that out of the time spent feeding, grazing took a greater percentage of the feeding period than browsing. This finding however agrees with those of Saka, *et al*, (2015) and Adeola *et al.*, (2018).

Food preference of Western hartebeest according to food class show that they are found to feed on leaves and stems of grasses during grazing but fed on leaves, fruits and seeds during browsing These findings are very similar to that of Ejidike and Ajayi, 2016 in a similar study in KLNP and that of Saka, *et al.*, (2015).

CONCLUSION

Based on the findings of the study, the following conclusions were made;

1. The family *Acelaphinae* in which the western hartebeest *Acelaphus buselapus* belongs is the present global conservation focus.
2. The result of the population density obtained in this study revealed that the population of the species under study is scanty.

3. Result of the population structure obtained from this study shows that no age group is under threat.
4. Grazing was found to dominate browsing in their food type selection. They are found to feed on leaves and stems of grasses during grazing but fed on leaves, fruits and seeds during browsing.
5. Poaching, loss of habitat and disturbance by cattle were the major environmental challenges threatening the survival of the species

RECOMMENDATIONS

i. The result of the population suggests that the Park management use proper conservation strategy to improve their population.

ii. The management can maintain the population structure by the use of appropriate means.

iii. A good range management practice such as early and late burning at the appropriate time should be employed by the Park management to improve or sustain the present range condition to ensure adequate, sustainable, and palatable food in the Park.

iv. There is a need for more knowledge on the species abundance and the problem facing the species in protected areas since it is on the endangered list (IUCN, 2008). The proper conservation and management of the species, habitat, ecology, and abundance would be needed for its sustainability in the protected areas such as Kainji Lake National Park.

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