Journal of Sustainable Technology JoST Volume 4, No. 1, April, 2013

# JoST

*ISSN: 2251-0680*

# Journal of Sustainable Technology

Volume 4, No. 1, April, 2013

CERAD
CENTRE FOR RESEARCH AND DEVELOPMENT
THE FEDERAL UNIVERSITY OF TECHNOLOGY,
AKURE, NIGERIA.

www.jost.futa.edu.ng

*Centre for Research and Development (CERAD)*
*The Federal University of Technology, Akure, Nigeria*
*JoST 2013*

# Relative abundance and distribution of western hartebeest *Alcelaphus buselaphus* Pallas 1766 in Borgu sector of Kainji Lake National Park, New Bussa, Nigeria

**EJIDIKE, B.N.[1]* and AJAYI, S.R.[2]**
**[1]Department of Ecotourism and Wildlife Management, The Federal University of Technology, Akure Ondo State, Nigeria.**
**[2]Federal College of Wildlife Management, New Bussa, Niger State, Nigeria.**

**ABSTRACT: This study investigates the availability and distribution of the western hartebeest, *Alcelaphus buselaphus* in Borgu sector of Kainji lake national park. Abundance and distribution of western hartebeest was assessed based on the sex, group/herd size, age range and other activities of the animal in relation to the specific features in the park. The animal was observed using direct and indirect methods of observation at 0700 -1400h and 1600 - 1830h thrice in a week over 16 weeks. Results indicated that western hartebeest move in groups of both adult and young of both sexes. A total of 245 individuals were sighted in different tracks in the park during the study The sex population structure of western hartebeest was 33% male to 67% female. The age and sex structure of adult male and female, juvenile male and female of western hartebeest expressed in percentage is 24% and 56%, 9% and 11% respectively, which signified a continuation of the western hartebeest in the park. The highest relative abundance of western hartebeest population occurred in Olusegun Obasanjo track with density of 3.6/km$^2$ indicating easy visibility of the western hartebeest in the track. Shehu Shagari track had the least western hartebeest density of 0.4/km$^2$ in the park. The variation in the population density might be due to the differences in vegetation type of the tracks. The western hartebeest moves in herds, is not aggressive and associates freely with other large, medium and small sized ungulates in the park.**

***Keywords:*** Availability, distribution, western hartebeest, non-aggresive, age structure, group/herd

JoST. 2013. 4(1): 68-73.
Accepted for Publication, January 14, 2013

## INTRODUCTION

Each creature has a unique niche in ecosystem and the system has to be balanced for well being of every living organisms. Research and conservation activities in protected areas tailor towards maintaining the ecosystem for continuity of biodiversity. In most African countries wildlife represent the principal source of animal protein for the rural dwellers (Dutoit, 2002). However, population of wild animal species in parks continues to dwindle due to some natural and anthropogenic factors such as disease outbreak, poaching and habitat destruction. These are among the reasons of advocating for proper management and update of the resources in protected areas.

Western hartebeest is one of the endangered wild animal species (IUCN, 2008). In most national parks poaching of wild animals for the

*Correspondence to: Ejike, B.N.; bndike@yahoo.com

value attached to their meat and trophies has great influence on their population decline. Poaching and illegal killing of wild animal species in protected and reserved areas has detrimental effects on the animal's population and in most cases enlist some animal species into the endangered list, especially low prolific species. According to (Aremu, 2005) hartebeest is among the animal species of poachers target at Kainji Lake National Park (KLNP) and that exerts negative pressure on the animal's existence.

Assessment of the abundance of western hartebeest, *Alcelaphus buselaphus* in Borgu sector of KLNP, New Bussa, Nigeria is relatively needed as a management tool as well as for eco-tourism development which are among the major aims and objectives of most national parks. Positive increase in population diversity of wild animal species within the habitat carrying capacity is vital in conservation practices in protected areas. As a result management of population, food, shelter and cover of wild animals are the basic components of any functional habitat for the animal's survival and multiplication. The objectives of this study is to establish the availability of western hartebeest, their age, sex, location and relative abundance in Borgu sector of KLNP.

## MATERIALS AND METHODS

The study was conducted in Borgu sector of KLNP which covers an area of 3,970.02km$^2$ being >70% of the park area. KLNP is the premier national park in Nigeria situated in the northern part of the country with its boundary between the Sudan and the Northern guinea savanna (Keay, 1959) and lies between latitude 9$^o$ 45' and 10$^o$ 23'N and longitude 3$^o$ 40' and 5$^o$ 47'E. The park has a total area of 5,340.82km$^2$, separated into two distinct non-contagious sectors. Reconnaissance survey was carried out on which eight tracks transects with a mean distance of 4km$^2$ each was marked. Binocular (Mcslco Sehfeld 8m/9800000m) was used in sighting the animals at 25-60m away from the observation point.

**Animal observation**

**Direct method**

Western hartebeest were observed directly as they carried out their daily activities in the park and data collected were recorded on the designed observation sheet. A 4-wheel drive vehicle at a speed of 30km/hour was used during observations at 0700-1400hours and 1600-1830hours thrice a week.

**Indirect method**

Indirect method was used through their feacal samples and foot prints, which were observed, checked, counted and recorded. The feacal samples and foot prints were identified by an experienced park ranger attached to the study. Relative abundance was calculated as recommended by (Mosby, 1987) formula as follows: $P = {}^{AZ}/_{ZXY}$ km$^2$

Where, P – Population, A – Total area, Z – number of group of animal sighted (each species treated separately) X – mean (x) Sighting distance, Y/ length/area of transect.

**Statistical analysis**

Data collected during this study were collated and subjected to descriptive analysis.

## RESULTS AND DISCUSSIONS

Western hartebeest *A. buselaphus* is one of the diurnal large herbivorous mammals that inhabit Borgu sector and it interacts well with other wild animal species such as African buffalo *Syncerus caffer*, bush buck *Tragelaphus scriptus*, baboon , warthog , red flanked duicker and roan antelope *Hippotragus equinus* in the park. This behaviour is associated with animals that live in herds/troops. In East Africa hartebeest was reported to associate with zebra (Dorst and Dandelot, 1970). These interactions with other mammals support the report of Aremu (2005) that western hartebeest in Yankari game reserve in Nigeria share territory with other large and medium mammals. Western hartebeest moved in herds of 4-12 animals per herd, which agree with Dorst and Dandelot (1970) that hartebeest is social animal that is usually seen in herds of 4 to 15 animals per head, sometimes up to 30 animals per head, confirming that hartebeest moves in herds. The animal moved in a single file with the dominant male leading them, once the animals in the group are in motion undisturbed. The presence of intruders such as man or large carnivores usually cause them to move in different directions only to come together but not in the same location. However, older male western hartebeest were solitary sometimes. The females move in groups with the young ones very close to the adults. It was observed that the western hartebeest usually rest during the hot afternoon after feeding in standing and lying positions which is similar to the resting position of forest African buffalo (Ejidike *et al*, 2010). During lying position western hartebeest usually face different directions with their young lying beside the females. The dominant male stands to watch the herd during resting period. The behaviour of the female western hartebeests shows that they exhibit parental care to the young ones. Daily activities of western hartebeest are presented in Table 1 which confirms the diurnal behavious as stated by IUCN (2008). Fig. 1 illustrates the distribution pattern of western hartebeest in the park and it indicates that the animal could be found in all parts of the park but predominantly at Olusegun Obasanjo track that recorded animal population density of 3.6 per $Km^2$. The highest population percentage (29.4%) of western hartebeest was found in Olusegun Obasanjo track which is in *Isoberlinia afzelia* woodland that comprises mostly grasses in the Borgu sector of the park. This relatively high population percentage of the animal in this track might be attributed to the grasses that grow there are mostly preferried grasses of the animal. Moreover the track is far from the water sources in the park such as Oli River. Shehu Shagari track had the least record of the western hartebeest population density with 0.4 per $Km^2$. The riparian vegetation of Shehu Shagari track which recorded the least relative abundance ($0.4Km^2$) of the animal might be due to the habitat being in close proximity to Oli river course and trees within it. *Alcelaphus buselaphus* is not a water loving animal (John, 2008). Shehu Shagari track that is in riparian forest in the park had the least record of population percentage (3.3%) of western hartebeest probably due to few grasses and more trees in the track, thus confirming the characteristic of the animal inhabiting grassy plain than forest trees (John, 2008). This low percentage might also be as a result of closeness of the track to Oli River hence western hartebeest doesn't prefer humid environment. Fig. 2 presents the sex composition of western hartebeest population in Borgu sector of the KLNP indicating the presence of both sexes at adult and young stages for continuous reproduction of the animal species in the park. Fig. 3 illustrates the relationship of the adult and

young western hartebeest in the park, showing a balance and presence of matured and young ones for immediate and future needs of the population growth of the animal in the park. From Figures 2 and 3, the higher populations of the adult and juvenile female of western hartebeest in the park prove the continuity of the animal a reality every other thing being equal. For proper utilization and management of wild fauna species in protected areas, information on the abundance of species at interval is essential for their conservation.

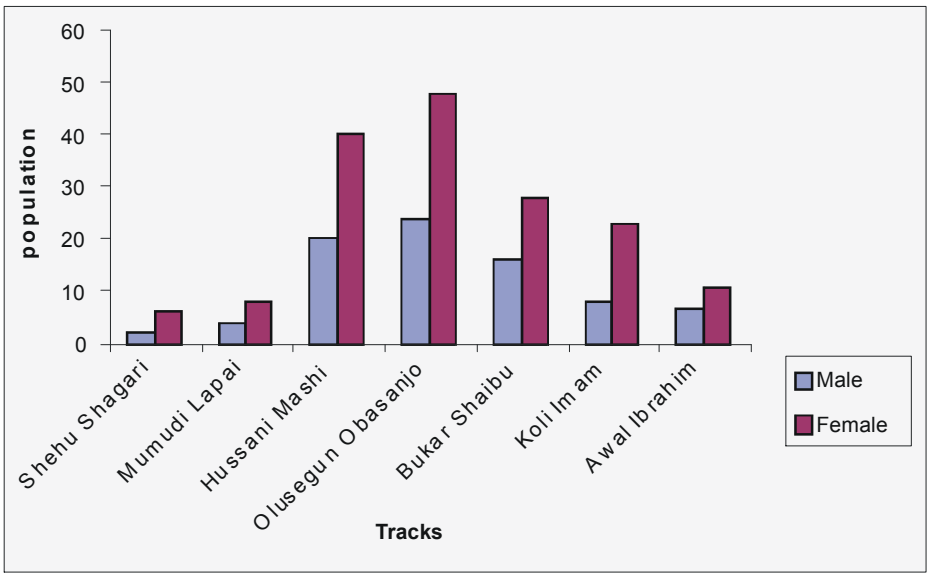


**Fig. 1: Distribution of hartebeest in Borgu sector of Kainji lake national park**

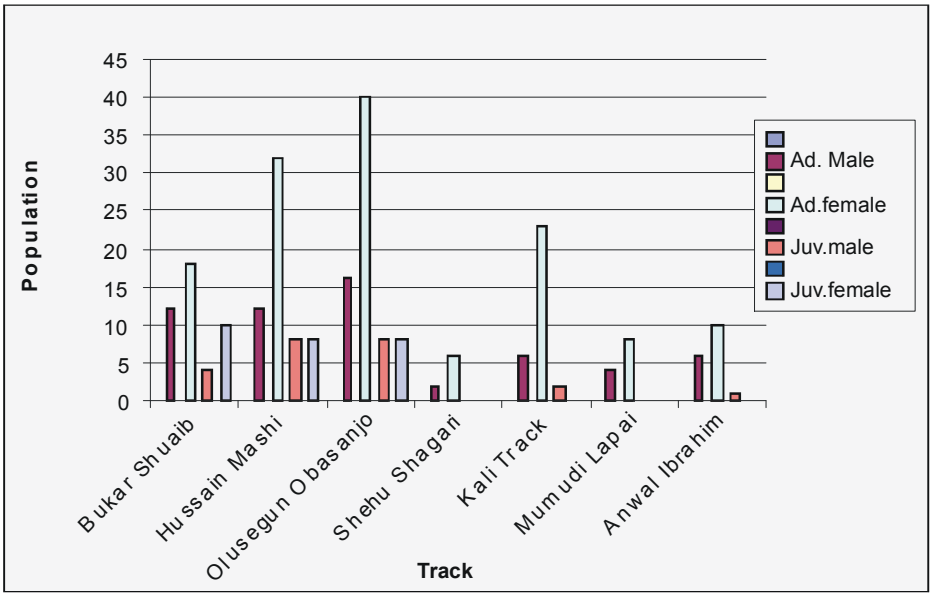


**Fig. 2: Sex and age population structure of hartebeest in Borgu sector of Kainji lake national park**

**Table 1 showing daily activities of western hartebeest *Alcelaphus buselaphus* in Borgu sector of Kainji lake national park**

| Period | Activities |
|---|---|
| 7.00am - 11.00am | Moming grazing. |
| 11.00am - 12.00pm | Retreat from grazing range to home range |
| 12.30pm - 4.30pm | Resting under tree canopies |
| 4.30pm - 6.30pm | Late afternoon grazing |
| 6.30pm - 7.30pm | Retreat from late grazing |
| 7.30pm - 7.00am | Night rest and gesticulating |

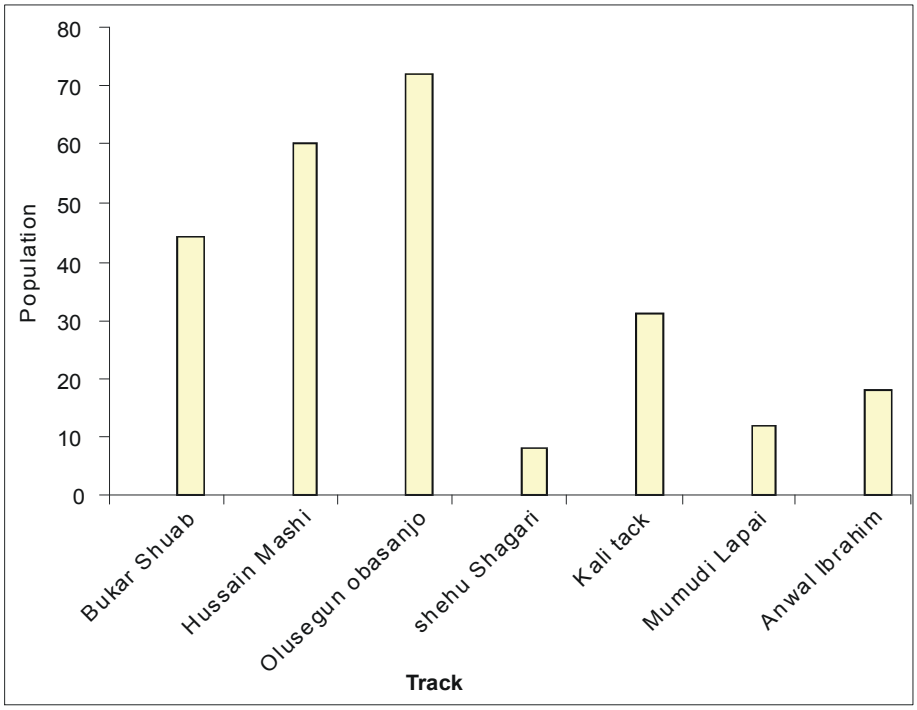


**Fig. 3: Distribution of western hartebeest in Borgu sector of Kainji Lake National Park**

## CONCLUSION

It could be deduced from the study that western hartebeest could be seen in Kainji Lake National Park wuithin the hours of 700-730 hours. The animal move in groups with association of both adult and young

## ACKNOWLEDGEMENT

We appreciate the Director of Nigerian National Park Service, Abuja for permitting us to undertake the study at Borgu sector of Kainji lake national park, New Bussa, Nigeria

## REFERENCES

**AJAYI, C.A. and IDUMAH, F.O. (2010).** Impacts of exploitation of forest resources on bushmeat supply and consumption in Nigeria. Proceedings of the 2nd Biennial National Conference of the Forests and Forest products Society. Pp 491-495.

**AREMU, O.T. (2005).** Ecology, Conservation and Socio-economic potentials of African Buffalo *Syncerus caffer nanus* in Kanji Lake National Park, Nigeria. A Ph.D thesis, Department of Forestry and Wildlife management, University of Agriculture, Abeokuta.190pp.

**DORST, J. and DANDELOT, P. (1970).** A field guide to the large mammals of Africa. Great Britain Collins Clear-Type Press, London and Glasgow. 287pp.

**DUTOIT, J.T. (2002).** Wildlife harvesting guidelines for community based wildlife management: A southern African perspective. Biodiversity and Conservation II. pp. 140-146.

**EJIDIKE, B.N., OLATUNJI, and DUROJAYE, G. (2010).** Some aspects of the ecology and behaviour of the forest buffalo (*Syncerus caffer nanus*) in Okomu National Park, Edo State, Nigeria. *Journal of Sustainable Technology*, **1**(1):107-112

**IUCN (2008).** Antelope Specialist Group (2008) *Alcelaphus buselaphus* in: IUCN SSC 2008. Red list of threatened species. Pp.???

**JOHN, H. (2008).** Habitat relationship of ungulates in Yankari Game reserve, Nigeria. The Wildlife Centre, Middle Garland, Chulmleigh, Devon, England. Blackwell Publishing Ltd and Mammal Society.

**KEAY, R.W.J (1959).** An outline of Nigerian vegetation. 3rd Edition, Government Press, Lagos.

**MOSBY, H.S. (1987).** Wildlife Investigation Technique. Wildlife Society Washington DC 146p