

COMPOSITION OF LARGE MAMMAL DAY-TIME VISITATION TO SALT LICK SITES INSIDE KAINJI LAKE NATIONAL PARK, NIGERIA

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(Received: 5th May, 2015; Accepted: 1st June, 2015)

ABSTRACT

Wildlife habitat utilization is crucial for effective conservation of large mammals. This study was conducted in three phases viz: focus group discussion with the park rangers stationed at Oli range on the location of salt-lick sites; identification, mapping, measurement and calculation of sizes of each salt lick sites, and direct observation of the composition of large animals visiting salt lick sites during the day-time at the Borgu sector of Kainji Lake National Park. Ten salt-lick sites were identified with the largest size (138.00m²) located within Gilbert Child track on longitude N09°54'81" and latitude E03°56'40" while the smallest size (5.70m²) is within Shehu Shagari track on longitude N09°54'66" and latitude E03°57'32". Three species of large mammals sighted visiting the sites during day time were kob (*Kobus kob*), western hartebeest (*Alcelaphus buselaphus*) and bushbuck (*Tragelaphus scriptus*). Although there are many salt-lick sites within Shehu Shagari track, large mammals sighted visiting the sites at Gilbert Child was higher. In general, adult female mammals were the most sighted and they preferred visiting the salt-lick sites mostly in the evening after feeding.

Keywords: Large Mammals, Salt-lick, National Park, Habitat Utilization

INTRODUCTION

Salt-licks occur naturally in certain locations in the forest where mineral salts are found on the ground surface (Lameed and Adetola, 2012). Ayotte *et al.* (2006) informed that areas where animals actively ingest soil have commonly been referred to as salt licks. Wild animal's rationale for licking salt is as a result of mineral deficiency inside the plant species consumed by them (Ayeni, 1975). Establishment of national parks, game reserves and other protected areas of natural habitat has been a major component of wildlife conservation and the network of protected areas are visible in the continent of Africa (IUCN, 1999). One of such places in Africa where natural minerals are located within protected area is Kainji Lake National Park, (KLNP) located in the western middle belt of Nigeria.

For effective *in-situ* wildlife management capable of holistic management plan, wildlife habitat utilization is imperative. In spite of the fact that some scholars in the past listed wildlife diversity of KLNP (Ayeni, 1975; Ayeni, 1975; Amusa *et al.*, 2010), very few literature on the species of large mammals visiting salt lick sites in Nigeria's premier national park exist. This study documents the

locations of natural salt-lick sites within Borgu sector of KLNP. We measured the sizes of the salt-lick sites and investigated the species of large mammals visiting the sites during the day time. The age and sex composition of the large mammals identified as well as the time of visitation were evaluated.

MATERIALS AND METHODS

Kainji Lake National Park (KLNP) is one of the seven national parks in Nigeria. KLNP was established in 1979 by the merger of Borgu game reserve (located in Niger and Kwara States) and Zurguma game reserve (located in Niger State) as shown on Figure I. The Park lies approximately between latitude 09°40' N-10°30' N and longitude 03°30' E - 05°50' E covering a total area of 5,340.82km² (Amusa *et al.*, 2010).

Methodology

This study was conducted in three phases. In phase one focus group discussion with the park rangers stationed at Oli range, Borgu sector of KLNP was conducted. The aim was to obtain information on the location of salt lick sites commonly utilized by wild animals inside the Borgu sector of the park. The second phase was

in company of some of the park rangers, during which the geographic locations and sizes of the identified salt lick sites were estimated. Direct observation on the species of large mammals visiting the sites during the day time was the third phase of this study. To achieve this, visits were made to the study area three times a week for four months. During each outing at the sites, field assistance maintained a high hide of about 250

meters away from each of the sites. The age and sex composition of the visiting mammals and the time of their visits to each site simultaneously were recorded. The instruments and equipment/tools used in this study were Global Positioning System (Model GPS Map 76C GARMIN), digital camera, watch, measuring tape, binoculars, field note and writing materials.

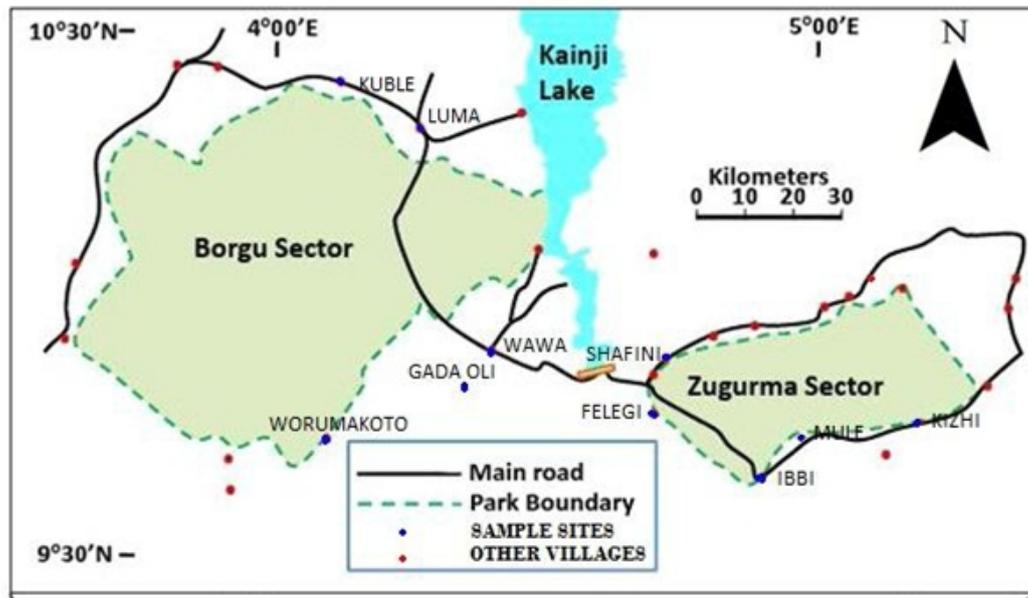


Figure 1: Map Showing the Two Sectors of Kainji Lake National Park

RESULTS AND DISCUSSION

Description of Salt-lick Sites Inside Kainji Lake National Park

Focus group discussion with the park rangers regarding the commonly utilized salt lick sites inside Borgu sector of KLNP revealed that the sites were located along the bank of River Oli within Shehu Shagari and Gilbert Child tracks. In all, ten salt lick sites were identified (Table 1). Of the ten salt lick sites investigated, four were found within Gilbert Child track while the remaining six are situated within Shehu Shagari track. The largest size (138.00m^2) of the saltlick site are located within Gilbert Child track on longitude $\text{N}09^{\circ}54'81''$ and latitude $\text{E}03^{\circ}56'40''$ while the smallest size of the saltlick site (5.70m^2) are within Shehu Shagari track on longitude $\text{N}09^{\circ}54'66''$ and latitude $\text{E}03^{\circ}57'32''$. Variation in the size of the saltlick site (Plates 1 and 2) may be as a result of quality of the minerals inside the saltlick site,

patronage level of the animals, types of animals visiting the sites or the surrounding vegetation. It was reported that the geographical location, weather, foraging behaviour, changes in diet and distance individual animals travels to access different salt licks causes variation in the use of mineral salt (Ayeni, 1975; Izawa, 1993).

Species of Large Mammals Visiting Salt Lick Sites During Day-Time

Day-time visitation to salt-lick sites by different animals observed either by direct observation or the use of indices such as footprints and animal droppings in this study demonstrate the significant of salt-lick sites in wild animal nutrition. Table 2 shows that three species of large mammals were directly sighted at the salt lick sites although signs (droppings and footprints) of other large mammals especially Buffalo (*Syncerus caffer*) and Hippopotamus (*Hippopotamus amphibilus*) were also observed. Direct

observation of animal assessment however revealed that a total of 153 animals visited the salt lick sites. Of this number, *Kobus kob* (106) was the highest with 60.38% and 39.62% sighted inside Gilbert Child and Shehu Shagari tracks, respectively. This was followed by *Alcelaphus buselaphus* (43) with 90.70% and 9.30% sighted inside Gilbert Child and Shehu Shagari tracks respectively. The least was *Tragelaphus scriptus* (04) with 75.00% and 25.00% sighted within Gilbert Child and Shehu Shagari tracks, respectively. It was evident that more of the animals studied (106) were sighted at the natural salt lick sites located inside Gilbert Child compared to 47 sighted at Shehu Shagari track. Lameed and Adetola (2012) listed elephant (*Loxodonta africana*), buffalo (*Syncerus caffer*), western hartebeest (*Alcelaphus buselaphus*), roan antelope (*Hippotragus equinus*), water buck (*kobus defessa*), kob (*kobus kob*), bushbuck (*Tracelaphus scriptus*), oribi (*Ourebi ourebi*), red flanked duiker (*Cephalophus rufilatus*), grimm's duikers (*Sylvicapra grimmia*), warthog (*Phacochoerus aethiopicus*) and baboon (*Papio anubis*) as some of the species of wildlife utilizing salt lick in Nigeria. This study revealed that the species of large mammals visiting salt lick sites were similar but differs in their frequency of visitation. This study partially agreed with the observation of Tobler *et al.* (2009) and Blake *et al.* (2010) where they submitted that species of animals as well as their frequency of visits differs from one location to the other.

Age and Sex Composition of the Visitors

Age composition of the visitors revealed that of the total number of 153 animals visiting the salt lick sites, 122 were adults followed by twenty-five (25) juveniles while the number of infants (06) was the least (Table 3). Age composition was the same irrespective of the track studied. This may be connected with the stages of reproductive activity reported by Atwood *et al.* (2002, 2003). The sex composition of the Mammalian visitors revealed that the number of females (77) including lactating

mothers and pregnant females visiting the salt lick sites were higher than their male (53) counterpart. This was in conformity with the findings of Atwood *et al.* (2003) and Bravo *et al.* (2008) where they emphasized that reproductive activity was a huge factor for animals patronizing salt lick sites. Sex of 23 visitors which comprised of fourteen *Kobus kob* and nine *Alcelaphus buselaphus* were undecided (Table 4). This was due to the fact that all the features to determine their sex at distance (most especially animal horn) and the scrotal sac were not well developed. This may be connected with the stages of reproductive activity mentioned by Atwood *et al.* (2002).

Time of Salt Lick Sites Visitation

Large mammals visited the salt-lick sites in the morning, and evening (Table 5). The time between 10:00 and 2:00 might be used for foraging or resting elsewhere. The peak of animal visitation period was during the evening between 4:00 pm – 5:59 pm. Slight variation was however observed across the sites. The findings were similar to that observed by Lameed and Adetola (2012) and Blake *et al.* (2011) where they reported that mammals were active at salt lick sites during the day. Variation in terms of visiting hours of the animal may be connected with influence of field activities such as botanical rambling, wetland survey and habitat assessment, on animal behaviour as reported by Ogunjobi *et al.* (2012)

Salt-lick sites within Gilbert Child track were the biggest in size despite the fact that Shehu Shagari track harboured the highest number of salt lick sites. Irrespective of more salt lick sites inside Shehu Shagari track the numbers of large mammals sighted visiting salt lick sites at Gilbert Child track were higher and *Kobus kob* formed the majority. In general, adult female mammals were the most sighted in terms of age and sex composition and they preferred visiting the salt lick sites mostly in the evening after feeding.

Table 1: Description of Gilbert Child and Shehu Shagari Salt-Lick Sites Inside KLN

S/N	Tracks	Range	Location	Area cover (m ²)	Depth (m)	Elevation (m)
1	Gilbert Child	Oli	N09°54' 76"	15.10	1.00	24.70
2			E03°57'17"	138.00	2.20	242.00
3			N09°54'81"	100.00	2.70	24.70
			E03°56'40"			
4			N09°54'33"			
			E03°56'34"			
4			N09°54'48"	25.00	1.40	229.80
			E03°56'93"			
1	Shehu Shagari	Oli	N09°54'67"	5.70	0.70	241.70
2			E03°57'32"	38.70	0.70	240.50
3			N09°54'21"	41.50	0.30	238.10
			E03°57'76"			
4			N09°54'17"	36.80	1.00	239.00
			E03°57'94"			
5			N09°54'45"	33.10	1.00	235.00
			E03°58'76"			
6			N09°54'44"	49.00	4.00	245.10
			E03°58'76"			
			N09°54'29"			
			E03°59'19"			

Table 2: Species of Large Mammals at Salt-lick Sites

Family	Common name	Scientific name	Gilbert Child	Shehu Shagari	Total
	Kob	<i>Kobus kob</i>	64(60.38%)	42(39.62%)	106(100%)
	Bushbuck	<i>Tragelaphus scriptus</i>	03(75.00%)	01(25.00%)	04(100%)
	Western Hartebeest	<i>Alcelaphus buselaphus</i>	39(90.70%)	04(9.30%)	43(100%)
	Total		106	47	153

Table 3: Age Composition of Large Mammals at Salt-Lick Sites

Track	Animal	Adult	Juvenile	Infant	Total
Gilbert Child	Kob	49	11	04	64
	Bushbuck	03	-	-	03
	Western Hartebeest	33	06	-	39
Shehu Shagari	Kob	32	08	02	42
	Bushbuck	01	-	-	01
	Western Hartebeest	04	-	-	04
	Total	122	25	06	153

Table 4: Sex Composition of Large Mammals Visiting Salt-Lick Sites

Track	Animal	Males	Females	Undecided	Total
Gilbert Child	Kob	23	31	10	64
	Bushbuck	03	-	-	03
	Western Hartebeest	10	20	09	39
Shehu Shagari	Kob	12	25	05	42
	Bushbuck	01	-	-	01
	Western Hartebeest	03	1	-	04
	Total	52	77	24	153

Table 5: Time of Animal Visitation at Salt-Lick Sites

Time of visitation	Number of Animals observed (N=48)					
	Gilbert Child			Shehu Shagari		
	Ko	Bb	Wh	Ko	Bb	Wh
7:00 – 7:59am	01	01	10	03	-	-
8: 00 - 8:59am	04	-	02	05	-	-
9: 00 – 9: 59am	-	-	-	-	-	01
10:00- 10:59am	-	-	-	-	-	-
2:00 – 2:59pm	03	-	02	08	-	-
3:00 – 3:59pm	11	01	06	-	-	-
4:00 – 4:59pm	16	01	01	11	01	03
5:00 – 5:59pm	29	-	18	15	-	-
Total	64	3	39	42	1	4

Key Ko= Kobs, Bb=Bushbuck, Wh=Western hartebeest

**Plate 1: A Saltlick Site Within Gilbert Child Track****Plate 2: A Saltlick Site Within Shehu Shagari Track**

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