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Assessment of habitat/species management area for Kobs in Kainji Lake National Park, Nigeria

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Abstract

Habitat management of spectacular species in protected areas requires some level of active intervention. Kainji Lake National Park, Nigeria designated certain areas for the management of Kobs (*Kobus kob*) known as Kob courts. The study, carried out in Borgu sector of the Park was aimed at assessing the areas, determine measures towards maintenance and the level of intervention. Data collection included direct and indirect methods of animal survey, plant enumeration and interview. 25m x 25m plots were demarcated in the Kob courts within which plant identification was carried out. Results revealed there are twenty-six (26) designated Kob courts on Gilbert Child, Yankari and Shehu Shagari tracks along the Oli river stretch in the Park *Terminalia macroptera* was dominant tree species in the Kob courts, followed by *Gardenia aqualla*, *Vitellaria paradoxa*, *Acacia* spp. while *Daniella oliveri*, *Burkea africana* and *Grewia mollis* recorded least occurrence. Active management practices are anti-poaching patrols, creation of waterholes and annual burning to encourage new flush and increase visibility by the tourists. Management interventions were not species-specific but common to all the animals. Regular inspection/monitoring are needed to ensure effective protection thereby enhancing species population increase.

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Introduction

Habitat management is essential in the management of wildlife. Wildlife habitat is the physical environment where an animal lives and gets the necessities of life (food, water, cover and space). Each species requires a particular habitat or the space, food, shelter and other needs of survival so much so that species are said to be the product of their habitat. Wherever an organism is provided with resources that allow it to survive, that is habitat. Management of wildlife requires modifications of wildlife habitat to meet the basic needs of the animals. This involves manipulating the types, amount, or arrangement of food, water and cover within a habitat for the purpose of making the habitat more suitable for a specific species. Wildlife management and conservation initiatives are only possible with the appropriate information on wildlife and its habitat (Kafley, 2008). Wildlife management is much more than the preservation of certain plant and animal species; it involves management of a complete ecosystem. When habitats are threatened, so are the animals that live there hence by protecting habitats, the wildlife is being protected.

Many nations of the world have designated areas for biodiversity conservation; these are otherwise referred to as protected areas. A protected area is a clearly defined geographical space, recognized, dedicated and managed through legal or other effective means, to achieve the long time conservation of nature with associated ecosystem services and cultural values. In national parks, game reserves and other protected areas, unique natural resources (flora and fauna), sceneries and landscapes areas are protected, managed and regulated for human benefit from one generation to another. Protection helps maintain ecological processes that cannot survive in most intensely managed landscapes and seascapes.

There are six categories of a protected area according to the International Union for the Conservation of Nature (IUCN).

Habitat species management area is category IV of the protected area and it is defined as “protected areas aiming to protect particular species or habitats and whose management reflects this priority” (Dudley, 2008). Natural ecosystems in Nigeria are highly vulnerable to many adverse influences deliberate or inadvertent (Marguba, 2002). Increasing human activities around the protected areas have been a major limitation to wildlife conservation especially in West Africa (Onadeko, 2004). The belief of most people that live around protected areas is that wildlife is gift from nature and is owned by everybody hence there is no need restricting its use. Moreover, most of them are unemployed and the soil texture in the area is unsuitable for agriculture leaving nothing other than hunting and harvesting of natural resources from forests around them. Destruction of the animals’ habitat and indiscriminate killing of young and pregnant animals has led to the disappearance of valuable wild animal species. Other factors which influence biodiversity or species loss as noted by Onadeko *et al.* (2001) are poaching, over-exploitation of forest, urbanization and other competing land use activities.

Kob (*Kobus kob* Exleben, 1777) is a medium sized antelope, belonging to family reduncinae of the grand order artiodactyla, even- toed ungulates. Although Kobs are still widespread and relatively numerous, yet they are highly vulnerable to poaching and habitat loss which has caused severe population declines (IUCN Red List, 2008). Anadu and Green (1995) whose record is limited to Nigeria reaffirmed that Kob has largely been eliminated outside conservation areas.

It is suspected that the situation will be worse now that a lot of advancement in hunting techniques and poaching strategy are unfolding daily. Aremu (2005) observed that kob was the most poached wildlife species in Kainji Lake National Park followed by *Thryonomys swinderianus* (Giant rat) with 20.19% and 11.27% level of poaching respectively.

There is therefore the need to put in place conservation measures for the effective protection of these species as they could easily become threatened if current conservation measures cease to be effective or altogether absent. Kainji Lake National Park management set aside some areas for the management of Kob, this paper attempts to assess the designated areas for the management of Kobs in Kainji Lake National Park; determine the measures in place towards maintaining the areas and the management approach to its effective management.

Materials and methods

Study area

Kainji Lake National Park is the first National Park in Nigeria established by the amalgamation of two former game reserves – Borgu and Zugurma in 1976 and the legal instrument for setting it up was promulgated in 1979 (Degree 46 of 1979).

The park was subsequently reconstituted under Acts 36 of 1991 and 46 of 1999 now Cap 9 Act 65 of 2004 which establish additional National Parks in Nigeria (Marguba, 2002).

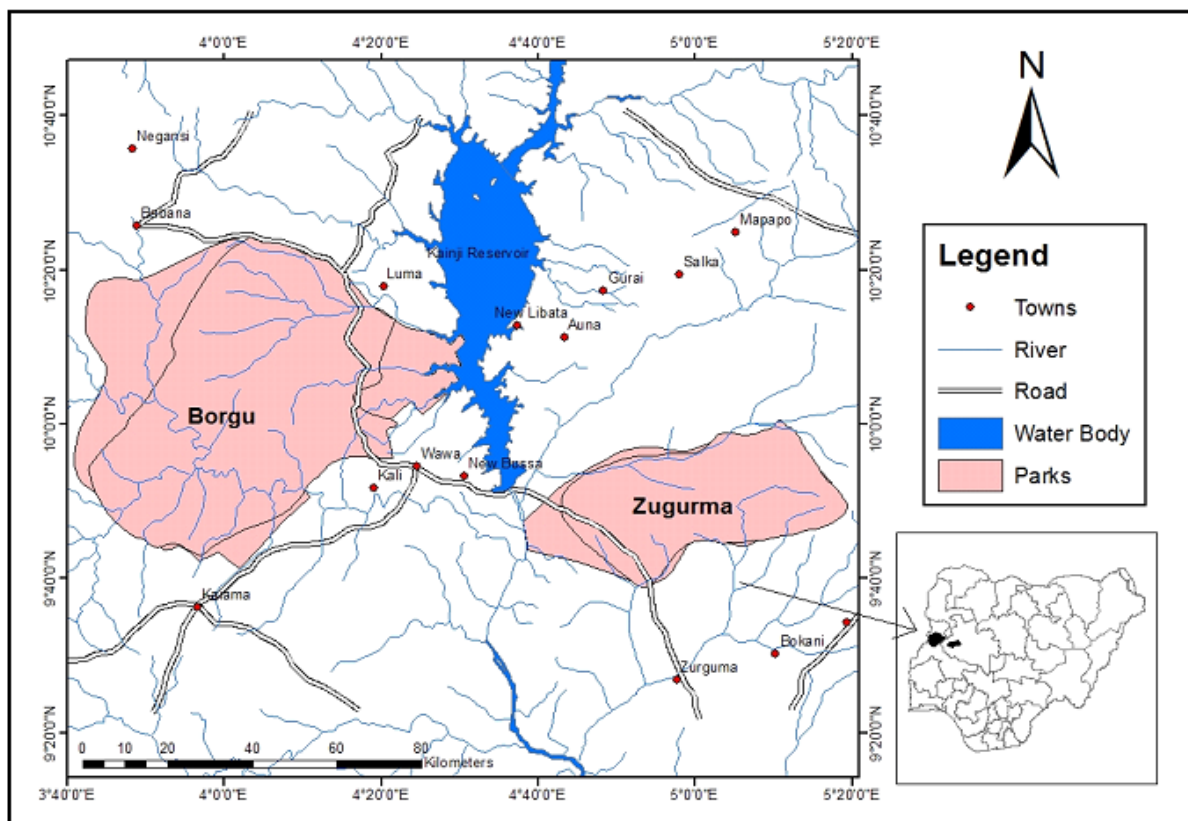


Fig. 1. Kainji Lake National Park.

The total area of the Park is 5340.82sq/km and it is separated into two distinct non-contiguous sectors namely: Borgu sector with an area of 3970.02 sq/km and Zugurma sector with an area of 1370.80 sq/km respectively (Jayeola *et al*, 2011).

This study was conducted in the Borgu sector of Kainji Lake National Park (Fig.1) which is situated in Borgu, Kaiama and Baruten Local Government Areas of Niger and Kwara State respectively (Jayeola *et al*, 2011).

The two sectors of the Park, Borgu and Zugurma, lie between Latitudes 9°40'N - 10°23'N and Longitudes 3°30'E - 5°50'E, and are separated by the Kanji Lake, a lake impounded on the River Niger for hydroelectric power generation (Ezealor, 2002).

The two major features of the climate of the park are the division into wet and dry seasons and the variability from year to year. The wet season extends from May to October. The mean annual rainfall varies from 1,100mm in the eastern part to 1,150mm in the West part.

The lowest temperature of the park about 12°C occurs between December and January while the highest mean maximum temperature occurs during months of February, March and April and is about 35°C (Afolayan, 1978).

The Borgu sector of the Park is mainly drained through River Oli which is the largest river in the park. The river covers an estimate of about 3.305kms from the Nigeria border with Republic of Benin (Sumaru) to where it empties into River Niger. The river has maximum flow of approximately 600-700mm³/sec of water. Other smaller rivers in the western part of Borgu sector are the lower and upper Oli, Suna, Nanu, Uffa, and an unnamed basin which covers about three quarters of the sector. In the eastern part are seven drainage basins giving a total of thirteen basins. Eroded water from these rivers contributes to the volume and rate of flow of the Oli River in the early part of the wet season. During dry season, surface flow ceases in all the rivers except the Oli River which breaks into pools providing sources of perennial water for wildlife population (Lameed and Adetola, 2012).

Afolayan (1977) identified seven vegetation types in Kainji Lake National Park. These are: i. *Burkea africana*/*Detarium microcarpum* woodland, ii. *Azelia africana* woodland, iii. *Isoberlinia tomentosa* woodland, iv. *Terminalia macroptera* woodland, v. *Diospyros mespiliformis* dry forest, vi. *Acacia* "complex" dry forest and vii. Riparian forest and woodlands. Dominant animals found in Kainji Lake National Park include buffalo (*Syncerus caffer*), roan antelope (*Hippotragus equinus*), Senegal Kob (*Adenotakob*), lion (*Panthera leo*), leopard (*Panthera pardus*), Nile crocodile (*Crocodilus niloticus*), python (*Python sebae*) and monitor lizards (*Veranus niloticus*) among others. Over 180 species have been recorded including such nationally uncommon species as Pink-backed pelican (*Pelecanus rufescens*), African darter (*Anhinga rufa*), Little bittern (*Ixobrychus minutus*), Secretary bird (*Sagittarius serpentarius*), Bateleur (*Terathopius ecaudatus*),

Stanley or Denham's bustard (*Neotisdenhami*), Spotted thick knee (*Berhinus capensis*), Water thick knee (*Berhinus vermiculatus*), Long tailed nightjar (*Caprimulgus climacurus*), Abyssinian ground hornbill (*Bucorvus abyssinicus*) and Red-shouldered cuckoo shrike (*Campephaga phoenicea*). Rare palearctic migrants such as *Falco subbuteo* and Common cuckoo (*Cuculus canorus*) have been recorded. The shores of Kainji Lake are wintering grounds for many hundreds of palearctic water birds (DRB, 2004).

Data collection

Two methods, interview and field survey were used for data collection. An interview was carried out with the Park staffs at the administrative head office of Kainji Lake National Park to investigate when the Kob courts were designated, the number and the range where they are. This was followed by field visit for on site assessment of the kob areas in company of experienced rangers of the park to validate information from interview. Identification of the location of kob courts were carried out by traversing through the areas. The number of kob courts identified during field visits was compared with the number told at the administrative head office. During field assessments, the management practices employed for the designated areas were also investigated. This was necessary to determine the ways the area is managed for the animal designated. Protection activities in the area was also investigated during field observations. Protection staff were interviewed on the type and level of active protection in the designated areas. Annual report of the Park was reviewed to compare result from interview with documented report on the Kob courts.

Field assessments was done by laying (25 x 25m) plots in each of the twelve Kob courts making a total of twelve (12) plots. Eight (8) Kob courts on Gilbert Child track, two (2) on Shehu Shagari track and two (2) on Yankari track. Within each plot, plant species in the plots were identified by a taxonomist. Other animal species utilizing the kob courts were also recorded.

Also noted were the activities of Kobs when sighted during the period of observation. Data collected were analyzed descriptively.

Results and discussion

Designated areas for Kobs in the Park

Results from the study shows that there are twenty six (26) Kob courts designated for the effective management of Kobs in the Borgu sector of Kainji Lake National Park. Table 1 shows twelve of the identified Kob courts and their locations. Observation of the Kob courts revealed that it was characterized with low vegetation close to permanent water, This is in line with Kingdon (1997) that the typical habitat of Kobs includes low-lying flats or gently rolling country close to permanent water, without seasonal extremes. Fryxell’s (1987) finding showed that Kobs are always associated with water,

and during the dry season about 80% of Kobs are seen within 10 km of water. Morjan (2014) observed that the abundance of Kob varied from low/no animal in areas of dry barren grounds and areas with human settlements to highest in areas with plenty of water and green forage far from human disturbances. He observed that Kobs were concentrated or crossing through habitats with plenty of water and vegetation such as rivers, streams and swamps. Several other studies have also found that water is the primary factor motivating antelope movements and dispersal (Scholte *et al.*, 2007; Voeten *et al.*, 2009; Young *et al.*, 2010). However, the result of the study carried out by Jayeola *et al.* (2011) on the past and present status of Kobs in Nigeria showed that Kobs were not restricted to watersides only and Kingdon (1997) also stated that Kobs can also be found sometimes in areas far from water.

Table 1. Identified Kob courts and their locations.

S/ Number	Kob court	Track
1.	Unnumbered	ShehuShagari
2	1	Gilbert Child
3	2	Gilbert Child
4	3	Gilbert Child
5	4	Gilbert Child
6	5	Gilbert Child
7	6	Gilbert Child
8	8	Gilbert Child
9	10	Gilbert Child
10	12	ShehuShagari
11	13	Yankari
12	14	Yankari

Ten (10) plant species were identified in all the twelve (12) plots in the identified Kob courts during the field survey. Table 3 shows plant species identified in all the plots. *Terminalia* spp. was observed to occur in all the identified Kob court except in Kob court 2. This was followed by *Gardenia aqualla* which occurred in eight of the Kob courts. *Vitellaria paradoxa* was found in five of the Kob courts; *Acacia* spp. and *Combretum nigricans* occurred in four of the Kob courts; *Piliostigma thonniigii* and *Tamarindus indica* occurred in two of the Kob courts while *Daniella oliveri*,

Burkea africana and *Grewia mollis* occurred in only one of the Kob courts.

Kob courts were designated for easier sightings during game viewing due to their abundance in certain areas of the park. It was noted that there was no special protection for the designated areas aside the normal routine anti-poaching patrols carried out to ensure the protection of the entire park. Burning is employed as a management practice in the designated areas to ensure new flush is available for the animals to feed on.

Terminalia spp (Figure 3) was present in all but one of the identified Kob courts. *Terminalia* is a genus of large trees of the flowering plants family Combretaceae.

According to Meduna *et al.* (2008), Kobs were observed to be seen mostly dominant in the Oli complex area of the Park.

Table 2. Activities of Kobs Sighted at the identified Kob courts.

S/No	Track	Kob court	Activities observed
1	Gilbert Child	1	Feeding
2	Gilbert Child	2	Running
3	Gilbert Child	5	Running
4	Gilbert Child	10	Feeding
5	ShehuShagari	12	Running

Table 3. Plant Species identified within the Kob courts.

Species name	Kob Courts												
	*	1	2	3	4	5	7	8	10	12	13	14	
<i>Acacia</i> spp	-	+	-	-	-	-	-	-	+	+	+	-	
<i>Gardenia aqualla</i>	+	-	-	+	+	+	-	+	+	+	-	+	
<i>Vitellaria paradoxa</i>	+	-	-	-	-	+	+	-	-	+	-	+	
<i>Terminalia</i> spp	+	+	-	+	+	+	+	+	+	+	+	+	
<i>Piliostigma thonningii</i>	-	-	+	-	-	-	-	-	-	-	+	-	
<i>Tamarindus indica</i>	-	-	+	-	-	-	-	-	-	+	-	-	
<i>Daniella oliveri</i>	-	-	-	-	-	-	-	-	-	-	-	+	
<i>Burkea Africana</i>	-	-	-	-	-	-	-	-	-	-	+	-	
<i>Combretum nigrican</i>	-	-	-	-	-	-	+	+	+	-	+	-	
<i>Grewia mollis</i>	-	-	-	+	-	-	-	-	-	-	-	-	

Key: * = unidentified Kob court

+ = Present

- = absent.

This probably could be as a result of the presence of *Hyparrhenia smithiana* which is one of the preferred foods of Kobs (Makanga, 2015) and the higher level of protection for the animals around Oli base camp of

the park, the presence of tourists and park wardens and rangers in this camp prevents poachers from coming around the area and the animal are safer.



Fig. 2. Kobs in court 4 in Kainji lake National Park.

Kobs were sighted in most of the designated areas in the park and their activities observed showed most of them running on sensing human presence. This is in accordance with Morjan (2014) that Kobs move away from human disturbances.

This could be as result of the intense poaching on them (Anadu and Green, 1995). As observed by Aremu (2005), Kobs were the most poached wildlife species in Kainji Lake National Park.



Fig. 3. *Terminalia* spp, present in all the Kob courts.

The designated areas were observed to be along the routes normally transversed during patrols by protected staff (park rangers) therefore providing additional protection for the animals. According to IUCN (2008), the status of the Kob will not likely change as long as there is effective protection and management for the various protected areas where the species can be found. The species could easily become threatened if current conservation measures cease to be effective; therefore, the future of Kobs is highly dependent on these conservation measures. Other animal species sighted in the Kob courts are roan antelope, baboons, and bush buck were seen around the Kob courts.

Conclusion

The study identified twenty six designated kob courts in Kainji Lake National Park withno special protection for the species in the designated areas aside from the general routine patrol for the whole park. However, proximity of some of the kob courts to the base camp gives extra protection to the ones around the Oli tourist base camp of the park.

Roan antelope, baboons, and bush buck were animal species that are also utilizing the designated areas. *Hyparrhenia smithiana*, *Terminalia macroptera*, *Gardenia aqualla*, *Vitellaria paradoxa*, *Acacia* spp., *Combretum nigricans* and *Pilliosigma thonnigii* are among the plantsspecies in the Kob habitat. Prescribed or controlled burning is employed as a management practice to ensure availability of new flush for the animals to feed on. Designation of the Kob courts within Kainji Lake National park is a management practice towards improvement of the kobs habitat for effective game viewing.

Recommendations

Effective management of Kobs in Borgu sector of Kainji Lake National Park demands that the habitat of this species be protected. It is recommended that additional protection be given to other kob courts which are farther away from the base camp, mini rangers' post can be built around these areas. This will help to prevent them from threat due to poaching, improve the habitat and well-being of other animals that are utilizing the area.

References

- Afolayan TA.** 1977. Effects of fire on the vegetation and soils in Kainji Lake National Park, Nigeria. Invited MAB-3 Project paper presented at the International Rangeland Congress, Colorado, USA.
- Afolayan TA.** 1978 Savanna burning in Kainji Lake National Park, Nigeria. East African Journal of Wildlife **16**, 245-255.
- Anadu PA, Green AA.** 1995. Antelope Survey. Longmans publishers, 83-90.
- Aremu OT.** 2005. Ecology, conservation and socio-economic potentials of African buffalo (*Syncerus caffer nanus*) in Kainji Lake National Park, Nigeria. Forestry and Wildlife Management, University of Agriculture, Abeokuta.
- DRB.** 2004. Ecological Survey of Kainji Lake National Park. Consultancy Report Submitted by the Development Research Bureau to the Project Preparation Manager, Global Environmental Fund-Local Empowerment & Environmental Management Project, Asokoro District, Abuja
- Dudley N.** 2008. Guidelines for Applying Protected Area Management Categories. Gland Switzerland: IUCN. x + 86 p.
- Ezealor AU.** 2002. Critical Sites for Biodiversity Conservation in Nigeria. NCF, Lagos. 97 p.
- Fryxell JM.** 1987. Lek breeding and territorial aggression in *Kobus kob. leucotis*. Ethology, **75(3)**, 211-220.
- Gehrt SD, Fritzell EK.** 1997 Sexual differences in home ranges of racoons. Journal of Mammals **78**, 921-931.
- IUCN SSC Antelope Specialist Group.** 2008. *Kobus kob*. In: IUCN 2008. IUCN Red List of Threatened Species. Retrieved 10 May 2016.
- Jayeola OA, Onadeko SA, Mafiana CF, Inah EI, Okeyoyin OA.** 2011. Past and present status of Kob (*Kobus (Adenota) kob (Erxleben)*) in Nigeria International Journal of Biodiversity and Conservation **4(5)**, p. 197-205.
- Kafley H.** 2008. Habitat Evaluation and Suitability Modeling of *Rhinoceros unicornis* in Chitwan National Park, Nepal: A Geospatial Approach. Institute of International Education World Wildlife Fund ITTO. p. 53.
- Kainji Lake National Park Annual Report** (2001), Federal Ministry of Environment.
- Kingdon J.** 1997. The Kingdon Field Guide to African Mammals. Academic Press, London and New York: Natural World.
- Krausman PR.** 1999. Some Basic Principles of Habitat Use. Presented in "Grazing Behavior of Livestock and Wildlife." 1999. Idaho Forest, Wildlife & Range Experimental Station. Bull. #70, University of Idaho, Moscow, ID. Editors: K.L. Launchbaugh, K.D. Sanders, J.C. Mosley.
- Lameed AG, Adetola BO.** 2012. Species-Diversity Utilization of Salt Lick Sites at Borgu Sector of Kainji Lake National Park, Nigeria
<http://dx.doi.org/10.5772/51089>
- Makanga S.** 2015. "The Kob antelope"
www.primeugandasafaris.com/blog/theKobantelope.html
- Marguba LB.** 2002. National Parks and Their Benefits to Local Communities in Nigeria. ISBN-178-056-724-0. Nigeria National Park Service. p. 1-48.
- Meduna AJ, Oyeleke OO, Amusa TO, Likita IB, Ajayi SR, Akor S, Patrick V.** 2008. Evaluation of Kob (*Kobus kob*, Erxeleben) habitat in Kainji Lake National Park, Nigeria. Obeche **26 (1)**, 40-44 p.

Morjan MD. 2014. Movements and Conservation of the Migratory White-Eared Kob *Kobus kob* Leucotis in South Sudan PhD Thesis, University of Massachusetts.

Onadeko SA. 2004. Home on the range: Crises, Consequences and Consolutions. UNAAB Inaugural Lecture series no 17. University of Agriculture Abeokuta, 86 p.

Onadeko SA, Inah EI, Shotuyo ALA. 2001. Bushmeat Consumption. In Biodiversity of the Rainforest Ecosystem in Nigeria. FEPA – UNAAB Linkage Centre for Forest, Conservation and Biodiversity. University of Agriculture Abeokuta.

Rija AA, Hassan SN. 2011. Population density estimates of some species of wild ungulates in Simanjiro Plains, northern Tanzania. African Journal of Ecology **49**, 370-372 p.

Scholte P, Adam S, Serge BK. 2007. Population trends of antelopes in Waza National Park (Cameroon) from 1960 to 2001: the interacting effects of rainfall, flooding and human interventions. African Journal of Ecology **45**, p 431-439.

The Plant List. 2010. assessed 9th Sept., 2015
www.theplantlist.org/browse/A/Combretacea/Terminalia

Voeten MM, Claudius AD, M de Vijver V, Oloff H, Van Langevelde F. 2009. Possible causes of decreasing migratory ungulate populations in an East African savannah after restrictions in their seasonal movements. African Journal of Ecology **48**, p 169-179.

Young JK, Murray KM, Strindberg S, Buuveibaatar B, Berger J. 2010. Population estimates of endangered Mongolian saiga *Saigataticamongolica*: implications for effective monitoring and population recovery. Oryx, **44**, p 285-292.