Assessment of major vegetation zones in relation to associated fauna in Toungo sector of Gashaka Gumti National Park, Nigeria

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ABSTRACT

The study surveyed the fauna species in relation to the vegetation zone in Gashaka Gumti National Park, Nigeria. The method used involved both primary and secondary data sources. The primary source of data involved field survey using line transects of 5Km each laid systematically at each vegetation zones of the sector of the park while secondary data were obtained by review of related documents on the park. Data were subjected to SPSS version 20 for descriptive statistics. The major fauna species associated with *Burkea africana* wooded Savannah were *Cercopithecus mona* (Mona monkey) which recorded the highest proportion with 35.38%, followed by *Cephalopus rufilatus* (Red flanked duiker) with 20.00%, while *Phataginus tricuspis* (Pangolins) and Piping hornbill recorded the least with 3.08% each respectively. The animals associated with *Afzelia Africana/Daniellia oliveri* vegetation zone were *Papio anubis* (Baboon) which recorded the highest proportion with 33.33%, followed by *Erythrocebus patas (Patas monkey)* with 18.84% and the least was *Syncerus* cafer (Buffalo) with 1.45%. Among the fauna species associated with *Prosopis Africana* vegetation zone, *Tragelaphus scriptus* (Bushbuck) recorded the highest proportion with 30.0%, *Cercopithecus aethiops* (Tantalus monkey), *Phacochoerus africanus* (Warthog) and *Ourebia ourebi* (Oribi) recorded 20.00% each respectively, and Crowned eagle recorded the least with 10.00%. In the *Accacia* vegetation zone, *Ptilopachus petrosus* (Stone partridge) recorded the highest proportion with 54.29%, while *Francolins bicalcarabus* (Francolins) and *Hippotragus equinus* (Roan antelope) recorded 37.14% and 8.57% respectively. It is hereby suggested that adequate protection should be given to this area in order to prevent the extinction of the wildlife species in the park.

Keywords: Vegetation zones, fauna, Gashaka Gumti National Park

INTRODUCTION

Nigeria's vegetation is one of the most endowed in Africa containing almost all the vegetation types that exist in other African countries and it is widely distributed in different zones of the country (Akinsoji *et al.*, 2016). Nigeria has two broad belts of vegetation types namely, forest and savannah types. However, there is also mountain vegetation of the isolated high plateau regions in the central and far eastern parts of the country (Allem, 2000). The vegetation of an area is a product of the plant material available and the prevailing environmental condition which include both the physical environment, land forms, soils, climate and factors such as the use of fire and grazing including the modification of the environment by the vegetation itself through transpiration, circulation of minerals, and plants decay (Adjanohoun *et al.*, 1991).

Vegetation makes up the habitat of wild animal species without which the animals will go extinct and it provides food, cover and escape cover for wild animal species. It is therefore important to regularly assess the vegetation and when necessary to manipulate it to suit wildlife management needs. The need to plan natural resources' management on the basis of accurate inventory, and take protective measures to ensure that the resources do not become exhausted is the concept of modern conservation. However, ecosystem degradation proceeds at alarming rates in many parts of Nigeria, including

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some protected areas which are meant to be conserved (Gumnior and Sommer, 2012). Ladipo (2010), indicated that nearly 90% of the rainforests in Nigeria have been cleared as at 2006. This clearance is not restricted to the forests alone as all habitats are under threat from civilization and other unsustainable human activities. The careless attitude of the populace and the high rate of poverty in the country have also resulted in this heavy loss (Ayodele and Yang, 2012). In order to prevent forest loss and to preserve biodiversity, the Nigerian Government had established several National Parks. One of the national parks established by Government is Gashaka Gumti National Park (GGNP). The idea behind the setting up of protected areas is to safeguard important areas for their aesthetic, recreation and wildlife values.

A protected area has been defined as an area of land or sea especially dedicated to the protection and maintenance of biological diversity and of natural resources managed through legal or other effective means (Ayeni et al., 1982). In Nigeria, it is certain that the survival of the protected areas depends on the careful management of natural resources (Flora and Fauna) and their environment. Habitat destruction by farmers, hunters and illegal logging activities has contributed greatly to the continuous degradation of wildlife habitat resources within the Park. Poverty has been the main driver of depletion of the fauna and flora resources, yet the resources have to be protected. Information on assessment of vegetation zone and its associated fauna in our National Parks is scanty or not available, particularly in Gashaka Gumti National Park. A study on vegetation and the associated fauna species is essential to generate data on the importance of the vegetation that are present within the park and the fauna that utilize them, and the study will serve as a field guide for the park management in their various management practices.

MATERIALS AND METHODS
Study Area
Gashaka – Gumti National Park is situated at the foot of the Mambilla Plateau and covers a land area of about 6,731 km². It lies between latitude 6°55'N and 8°05'N and longitude 11°13' to 12°11'E. The Park was formerly known as Gumti, Gashaka and Serti Game sanctuaries in the 1970's but on 26th August 1991, the three game sanctuaries were merged and upgraded to a National park by the Nigeria National Park. The purpose of establishing the Park was for the purpose of nature conservation, recreation, ecotourism, scientific and

medical research; and to promote the art, craft and other cultural values of the indigenous people of the immediate environment, just like any other Park. The Park is an outstanding tourist landmark in Taraba State. It is also the most diverse in terms of plant and animal species among the National Parks in Nigeria and West Africa as a whole.

Method and Instrument of Data Collection
The method used involved both primary and secondary data sources. The primary data source was field survey, using both direct and indirect (observation of wildlife indices). Line transect of 5Km were laid systematically in each of the identified major vegetation zones of the park. Reading was carried out at every 1Km intervals and data were entered into a data sheet on the field. The secondary data on the other hand comprised use of related documents on the park, especially those related to the past records of the vegetation. The study was carried out on three days of every first and last week of every month from 6am to 1pm, and 4 to 6.30pm morning and evening respectively.

Data Analysis
The data obtained were analyzed using the IBM SPSS version 20 computer statistical software package; the data were subjected to descriptive statistics and presented in tables as frequencies and percentages.

RESULTS
Table 1 shows the vegetation types and dominant tree species in the study area, four vegetation zones were identified, these include *Burkea Africana* wooded Savannah, *Afzelia africana/Daniellia oliveri* vegetation zone, *Terminalia macroptera* vegetation zone and *Acacia* vegetation zone; and also, 29 trees species were identified in all the identified vegetation zones. Table 2 shows the fauna species associated with *Burkea africana* wooded Savannah of which *Cercopithecus mona* (Mona monkey) recorded the highest proportion with 35.38%, followed by *Cephalopus rufilatus* (Red flanked duiker) with 20.0%, while *Phataginus tricuspis* (Pangolins) and Piping hornbill recorded the least with 3.08% each respectively.

The fauna associated with *Afzelia africana/Daniellia oliveri* vegetation zone are shown in Table 3, it was observed that *Papio anubis* (Baboon) recorded the highest proportion with 33.33%, followed by *Erythrocebus patas (Patas monkey)* with 18.84%, and the least was *Syncerus* cafer (Buffalo) with 1.45%. Table 4 shows the fauna species associated with *Prosopis Africana* vegetation zone of which *Tragelaphus scriptus* (Bushbuck) recorded the

highest proportion with 30.00%, while *Cercopithecus aethiops* (Tantalus monkey), *Phacochoerus africanus* (Warthog) and *Ourebia ourebi* (Oribi) recorded 20.00% each respectively, and Crowned eagle recorded the least with 10.00%. The fauna associated with *Accacia*

vegetation zone are shown in Table 5, *Ptilopachus petrosus* (Stone partridge) recorded the highest proportion with 54.29%, while *Francolins bicalcarabus* (Francolins) and *Hippotragus equinus* (Roan antelope) recorded 37.14% and 8.57% respectively.
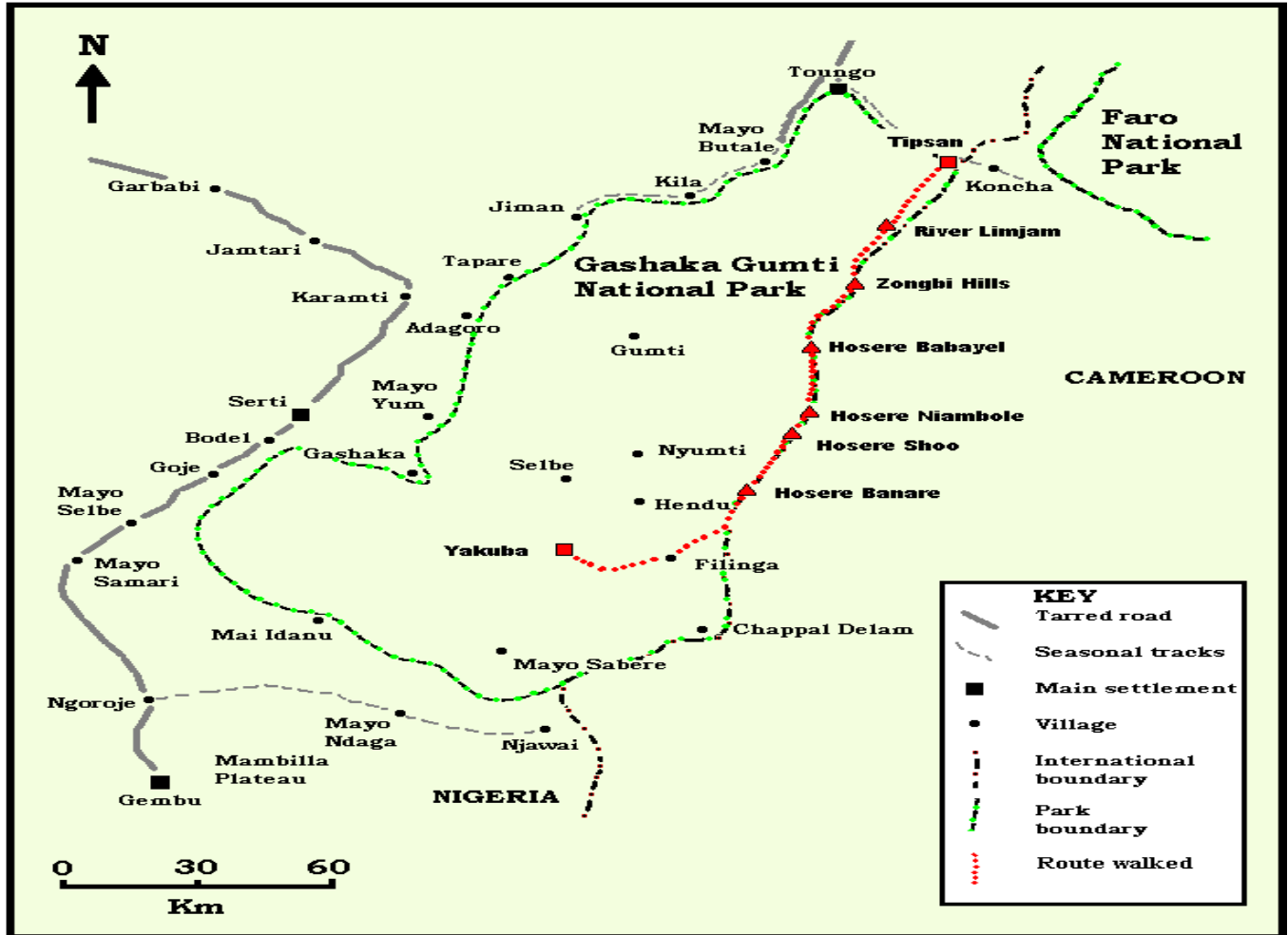

Figure 1: Map of the Study Area

Source: Oruonye et al. (2017).

Table 1: Major vegetation zones in the study area		
Major vegetation zone	**Location**	**Major tree/plant species**
Burkea Africana woodedSavannah	Gumti	*Burkea africana, Terminalia avicenoidea, Terminalia superba, Milicia excels, Ceiba pentandra, Trilepisium madagsaacariense, Pseudospondias preussi, Celtis zenkeri, Ficus spp, Olax subscorpioidea*
Afzelia africana/Daniellia oliveri Vegetation Zone	Toungo	*Afzelia africana, Daniellia oliveri, Crossopteryx febrifuga, Piliostigma thonningii, Combretum spp, Isoberlina tomentosa,Parkiabiglobosa and Adansonia digitata*
Terminalia macroptera Vegetation Zone	Tipsan	*Terminalia macroptera, Prosopis Africana , Spondia mobin, Khaya senegalensis, Tamarindus indica, Sterculia setigera and Vitex doniana*
Acacia Vegetation zone	Jimam	*Acacia seyal, Acacia gournaensis, Piliostigma thonnigii, Detarium macrocarpum, Ficus doniana, Bombax costatum*

Table 2: Animal species associated with *Burkea Africana* vegetation zone

Scientific Name	Common Name	Number Sighted	Percentage (%)
Euxerus erythropus	Striped ground squirrel	8	12.30
Cercopithecus mona	Mona Monkey	23	35.38
Hylochoerus meinertzhageni	Giant forest Hog	3	4.62
Potamochoerus porcus	Red River-Hog	2	3.08
Cephalophus silvicultor	Yellow Backed Duiker	6	9.23
Cephalophus rufilatus	Red Flanked Duiker	13	20.00
Buceros bicornis	Piping Hornbill	2	3.08
Hippotragus equinus	Roan Antelope	2	3.08
Cercopithecus nicitans	Putty-nosed monkey	6	9.23
	Total	**65**	**100.0**

Table 3: Animal species associated with Afzelia *Africana/Daniellia oliveri* vegetation zone

Scientific Name	Common Name	Number Sighted	Percentage (%)
Syncerus caffer	African Buffalo	1	1.45
Taurotragus derbianus	Giant Eland	2	2.90
Atherurus africanus	Porcupine	2	2.90
Papio Anubis	Olive Baboon	23	33.33
Kobus ellipsiprymus	Waterbuck	3	4.35
Kobus kob	Kob	11	15.94
Hippotragus equinus	Roan Antelope	9	13.04
Erythrocebus patas	Patas Monkey	13	18.84
Cercopithecus nicitans	Putty-nosed monkey	5	7.25
	Total	**69**	**100.0**

Table 4: Animal species associated with *Terminalia macroptera* vegetation zone

Scientific Name	Common Name	Number Sighted	Percentage (%)
Cercopithecus aethiops	Tantalus Monkey	2	20.00
Tragelaphus scriptus	Bushbuck	3	30.00
Phacochoerus africanus	Warthog	2	20.00
Ourebia ourebi	Oribi	2	20.00
Stephanoaetus coronatus	Crowned Eagle	1	10.00
	Total	**10**	**100.0**

Table 5: Animal species associated with *Acacia* vegetation zone

Scientific Name	Common Name	Number Sighted	Percentage (%)
Ptilopachus petrosus	Stone partridge	19	54.29
Hippotragus equinus	Roan Antelope	3	8.57
Francolinus bicalcarabus	Francolins	13	37.14
	Total	**35**	**100.0**

DISCUSSION

In nature wild animals and plants are not evenly distributed all over the habitat in any area (Wilson and Boulter, 2000), therefore the species' distribution in Gashaka Gumti National park (Tougo sector) is not an exception. Four major vegetation zones were identified in this sector of the park; these include *Burkea Africana* wooded Savannah, *Acacia* vegetation zone, *Terminalia macroptera* and *Afzelia africana/Daniellia oliveri* vegetation zones. Roan antelopes (*Hippotragus equinus*) were distributed over the entire vegetation zone but were

more associated with *Afzelia africana/Daniellia oliveri* vegetation zone.

The conservation status of some of the large mammals in the park was considered to be either endangered or vulnerable. The vulnerable species included Reedbuck, Striped Hyaena, common Jackal and Black and White Columbus monkey. Other species like Waterbuck, Leopard and Hunting dog were also considered to be endangered species. Species like Mona Monkey, Patas Monkey, Roan antelopes, Kob, Baboon and Stone Partridge were widely distributed within the Park and were common. Saha (2003) reported that food and escape cover play an important role in habitat selection of animals. Therefore, conservation of wildlife within protected areas depends mainly on maximizing the numbers of habitat patches that support self-sustaining populations. *Terminalia macroptera* had the lowest species diversity and succession status. The vegetation is fragile and looks like a regenerated vegetation. This could be due to frequent bush burning; and the adverse effects of bush burning have been listed by various authors (Afolayan, 1978). The result of the four vegetation zones investigated revealed that the vegetation type that had the highest plant species diversity was *Burkea Africana* wooded savannah. These findings are in agreement with the report of Obot (1986) on the woodland savannah of Borgu sector of Kainji Lake National Park.

The results of this work show that all the plants in the vegetation zone were highly utilized by the animals' species present in the study area. It was revealed that the Park has a wide spread ungulate species from different sub-families due to the following reasons. Firstly, extensive savannah grassland provides food for large number of grass-eating herbivores, food which is absent from rain forest although savannah contain fewer number of different mammal species than those in rain forest never support a greater total number of mammals (Andrew, 1999). Secondly, the open woodland and low shrub structure of the savannah is generally unsuitable for arboreal and other rainforest mammals, but it is suitable for these savannah mammals (Andrew, 1999).

Information from the park authorities also revealed that the decision to preserve five (5) broad species of plants including *Afzelia africana, Isoberlinia doka, Isoberlinia tomentosa, Diospyros mespiliformis* and *Acacia seyal* lead to the major conflict between the park authorities and the Fulani herdsmen that were involved in illegal grazing and looping. Moreover, they destroyed large plant species by cutting them down so that their cattle can fed on them,

particularly at the time when grasses are scarce, or when the dry season is at its extreme around April and May.

CONCLUSION
In conclusion, it is quite clear from this study that all the four vegetation zones identified were the most preferred habitat for the wild animals in the Toungo sector of Gashaka Gumti National Park. It can be deduced from the study that the study area is a woodland savannah vegetation zone; it is an area of transition between Guinea and Sudan savannah vegetation zones which comprised numerous medium trees and grass under growth. Adequate protection should be given to this area in order to prevent the extinction of the wildlife species in the park. The study recommends that new laws on strict protection and conservation of parks should be made by government to enhance proper check of offenders, and the Park authorities should engage the support zone communities in conservation and protection programs to create mutual relationship between the park management and the communities.

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