Volume 21 Issue 31
Originally issued as D7

Global Journal of Science Frontier Research: D
Agriculture and Veterinary
Volume 21 Issue 7 Version 1.0 Year 2021
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals
Online ISSN: 2249-4626 & Print ISSN: 0975-5896

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Result of the study indicate that absolute densities for Patas monkey (*Erythrocebus patas),* Tantalus monkey (*Cerlopitecus tantalus)*and Baboon *(Papio anubis)* were 0.28/km^2, 0.21/km^2 and 0.07/km^2 respectively. Fruits of *Vitex doniana, Anona senegelensis, Ziziphus maurit/ana and Detarium microcapum* were found to be preferred by the primates in the study area.

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GJSFR-D Classification: *FOR Code: 070199*



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I. Introduction

There are three, known species of Primate in Bagale Forest reserve of Adamawa State. Patas monkey *(Erythmcebus patas),* Tantalus monkey *(Cercopithecus tantalus)* and Baboon *(Papio anubis)*. Although they appear to be relatively abundant, there is no quantitative data available as to their status.

Wild animals census particularly for in-situ conservation areas is very important. Dunn (1993) observed that for effective wildlife management in protected areas, policies must be based upon reliable and appropriate data. Mc Kinnon *et al*(1986), reported that the effective conservation of wild animal resources require the knowledge of what species occur within the conservation area, where and in what numbers as well as what are population trends over time?

Primate census is also very important in that it provides useful information regarding the magnitude of local hunting pressure and the health status of the conservation area, Akosim (1997), reported that the flourish primates populations are usually indicators of general good health of the forest ecosystem. For example, if there is a full complement of species and the population density of each is high, then the hunting pressure can be said to be low and the conservation area to be in good health, on the other hand low population densities and local extinctions of some species are indications of high hunting pressure and the presence of other adverse conditions (Dost and Dandlot, 1990; Dunn 1992).

However, it has been observed that increase human population has taken its toll on forest resources as a result of increase in demand for land for arable farming, logging for timber for construction of houses, road construction and urbanization. (Ijomah and Akosim 2000). This situation has led to serious increase into conservation area such forest and game reserve with the attendant depletion of wildlife resources including primates.

Therefore the primate census of Bagale forest reserve would not only provide information on the status of the primate in the reserve but would also indicate the health status of the habitat. These information will serve as baseline data for the development strategies and for proper management of the habitat.

Furthermore, knowledge of the food items preferred by the primate will also help to determine the overall management strategies that will ensure adequate cover and food for the primate. Primate population and food preference studies have not been carried out in Bagale forest reserve since its establishment, have the need for this study which aimed at determining the absolute density and food preference of the primate species in the study area.

a) Factors that Determine Wildlife Population

Piteka (2002) recorded that ecological factor such as competition affect the population size of animals while predators remove individuals from pray populations and may directly influence both survival and reproduction. The physical factors include temperature, rainfall, wind and relative humidity as observe by (Ijomaj and Akosim 2000).

Seber (1999) listed some of the sociocultural factors affecting wildlife conservation in Nigeria to include the belief that wildlife resources is inexhaustible as well as lack of awareness of the benefit of conservation.

b) Wildlife Population Census

There are many reasons why wildlife population census are conducted. According to Dunn (1993)

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wildlife is increasingly being regarded as renewable resources. Akosim (1997) listed various methods use in wild animal enumeration at various places. These methods already in use include: Total count, the use of quadrat, line transect method, capture, marking and recapture, and indirect method such as fresh dropping and foot print. Each of these methods has it merits and demerits. The method use depends on the objectives of the study, the peculiarity of the habitat, the animal to be counted and the facilities available.

c) Forage Preference

Halls (2005) stated that preferred plant species are those chosen and eaten by the animals more frequently than other. Ijomah and Akosim (2000) associated forage preference with palatability. They reported that palatability is that quality in forage plants that makes it preferred when a choice between plants is available.

Selection may also be influenced by availability in situations where there are few species and each occur in limited quantity the only alternative is to feed on the available species (Akosim 1997).

II. Methodology

a) Study Area

Bagale Forest Reserve is located within Girei Local Government Area of Adamawa State, Nigeria. It extends between latitude 9° 11° N and 9° N and longitude 12° 20° E 12° 30° E with a total area of (111.04km^2). The reserve is bounded to the North by Song, to the East and South by Fufore and to the West by Yola North Local Government Areas.

The area is dominant by Bima sandstone, it consists of fine sand, clayish sand silt ironstone and alluvium deposits, which consist of both clay and salty clay. The reserve experience two distant seasons, the dry season, which last from November to March and the raining which last from April to October. The Minimum rainfall is 0.4mm while maximum rainfall is 475mm with a total rainfall of 1030mm per annum (MAU 2020).

The vegetation is savanna woodland. It also has the characteristic of open biotype. Trees that are common include *Vitex doniana,Tamarindus indica, Veteileria Paradoxa, Parkia biglobosa, Burkea africana, Combretun, hypopilum, Khaya senegalensis* etc, while grass species that are commonly found include: *Andropogon gayanus, Bidens pilosa, Panicum, maximum, Seteria, tarbata, Pennisetum, pediceitatum, Ipomea trileba* and so on (Akosim *et al,*2020). The Fauna resources in the study area consist of Lion (Panthera Leo), Red Patas monkey *(Erythrocebus patas),* Baboon *(Papio anubis),* Tantalus monkey *(Cerlopithecus tantalus),* Rock Python *(Python regins),* Ground squirrel *(Xerus erythropus) etc.*

b) Study Design

A reconnaissance survey prior to detailed study was carried out. This was 'to enable the researcher to assess the species of primate in the reserve, type of food available and their distribution.

Three transect 1km apart were cut at random based on Ogunjemite (2004) methods. The length of the transect vary from 8km to 9km according to the nature of the area. The three transects were cut following a sighting compass on a predetermined bearing. The width of the transect was 2.5m while the length were accurately measured using a 50m tape.

III. Data Collection Techniques

a) Primate Census Study

Each transect was walked once in a day for 10 days. The census took place between 6:00am and l: 00pm. The census commenced at approximately the same time each day. They were three observers. Observers moved slowly and quickly at the rate of l-l.5km/hour stopping occasionally to listen and watch for animal. When the primate were encountered, the species group, size and the group spread swere noted and the sighting distance measured.

b) Food Preference Study

The direct observation method as described by Tomlison (2004), was used with modifications. Hence instead of using the feeding - minute or Bite count, in relation to percentage available to determine food preference, the frequency of sighting or occurrence of forage species in the animal's diet was used as index or preference and consumption. The technique involved the use of binoculars to observe the specific site where feeding took place, followed immediately by onsite inspection of the utilized plants for the purpose of identification. Records of the utilized food items were made from which the frequency of occurrence of each forage species in the animals diet was determined. The preference ranking was carried out according to the order of magnitude of the frequency, thus providing a preference ranking for each species (Tomlison, 2004)

IV. Data Analysis

Estimate of absolute densities of primate encountered was carried out using the kings census model as follows:

$$D = {}^{n}/_{2LF}$$

Where D=the absolute density,
n=Total number of individual of a species sighted
L= Average sighting distance

Frequency distribution was used in analyzing data on food preference study.

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V. Result and Discusion

The result of the study are presented in Tables 1,2,3 4 and 5. Table 1, shows the result of absolute densities of primate in the study area. A total of three species of primate were censused in the reserve. The result indicated that the absolute densities for primate were baboon (0.17/km^2), Patas monkey (0.28/km^2) and Tantalus monkey (0.021/km^2) the result shows that Patas monkey had the highest occurrence per square kilometer while Baboon has the least. The result of absolute" population densities of the primate species, are indicative of their status in the forest reserve. This observation agreed with Dost and Dandelot (1990) report of primates characteristic of northern guinea Savanna. However, when the result is compared with what was obtained by Gawaisa (1997) for Baboon (2.62/km^2), Tantalus (1.36/km^2) and Patas (0.34km^2) in Gashaka Gumti National Park, the population of primates in Bagale for estreserve may be said to be low. The primate species population result from this is an indication of the fact that one or more of the factors that negatively affects wildlife population are in operation in the reserve. This situation must have resulted from illegal removal of wood resources from the reserve for fuel wood and building as well as extension of agricultural land into the reserve resulting in total clearing of wood plants upon which the primates depend for both food and cover. The record of daily sighting are presented in Table 2 to 4.

In transect 1 (Table 2) out of a total of 566 sightings, S41 (96%) were in "group" 18 (3%) were "solitary" and 7 (1%) uncertain, while in transect 2(Table 3) out of a total of 356 sightings 338 (94.9%) were in "group" 18 (5.5%) were solitary and none uncertain. In transect 3 (Table 4) shows that for a total of 387 sightings 371 (95.9%) were in "group" 14 (3%) were "Solitary" and 2 (0.52%) were uncertain.

Result of food preference ranking (Table 5) indicates the food plants (fnut) preferred by primates in the reserve. Baboon mostly feed on the fruits of *Vitex doniana,* followed by *Annona senegalensis* and *Ziziphus mauntiana* Patas monkey preferred the fruits of *Annona senegaless* followed by *Detarium microcapun* while Tantalus monkey mostly fed on the fruits of *Detarium microcapum* and *Prospis africana.* All primates in Bagale forest reserve utilized fruit of *Annona senegalensis as* indicated in the Table.

VI. Conclusion

The results of this study shows that the Bagale Forest reserve contains representative sample of primates found in the Savanna ecosystem. The status of the primates when compared with what obtains in similar ecosystem of the Savanna indicates that the primates' populations in the reserve are low. The low population is not unconnected with high incidence of poaching, and deforestation of the reserve. Result of the food preference study showed that the three primate species selected *Annona Senegalenois as food vitex domiana and Ziziphus mauntiana were preferred by Baboon, patas monkey preferred Detarium microcapum in addition to Anona Senegalensis while Tantalus monkey fed mostly on Detarium microcapum and prosopis africana.*

Table 1: Estimate of primates population in Bagale Forest Reserve

Primate	Absolute densities No/km^2
Baboon *(Papio Anubis)*	0.17
Patas Monkey *(Erythrocebus patas)*	0.28
Tantalus Monkey *(Cercopithecus tantalus)*	0.12

Table 2: Type of sighting of primate species at transect 1 in the study area

Species	Group	Solitary	Uncertain	Total
Baboon	170	10	5	185
Patas Monkey	211	6	0	217
Tantalus Monkey	160	2	2	164
Total	541	18	7	566

Table 3: Sighting of primate species at transect II in the study area

Species	Group	Solitary	Uncertain	Total
Baboon	83	1	0	84
Patas Monkey	165	14	0	170
Tantalus Monkey	90	3	0	93
Total	338	18	0	356

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Table 4: Type of Sighting of primate species at transect III in the study area

Species	Group	Solitary	Uncertain	Total
Baboon	131	0	0	131
Patas Monkey	140	12	1	153
Tantalus Monkey	100	2	1	103
Total	371	14	2	387

Table 5: Food preference/Ranking for Primate in the study area

S/N	Primate Species	Species of Plant Utilized	Ranking/Frequency
1.	Baboon	*Vitex doniana*	1
		Annona Senegaiensis	2
		Ziziphus Spina-christi	2
		Ziziphus Mauritiana	3
		Gardenia aecqulla	3
		Combratum spp	4
		Ficus platyphylla	4
2.	Patas Monkey	*Annona Senegaiensis*	1
		Detarium Microcarpum	2
		Vitex doniana	3
		Ziziphus Mauritiana	3
		Vetellaria Paradoxa	3
		Balanite aegyptica	4
		Tamarindus indica	4
		Ficus platyphylla	4
3.	Tantalus Monkey	*Ziziphus mauritiana*	1
		Deterrium microcarpus	2
		Prospis africana	2
		Balamite aegyptica	3
		Ximanania Americana	3
		Annona senegalensis	3
		Vetellaria aradoxa	4
		Parkia biglobosa	4
		Ziziphus spina-christi	4
		Vitex doniana	4

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