

Research article

# Species List and Status of Mammals and Birds in Chingurmi-Duguma Sector of Chad Basin National Park, Nigeria.

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## ABSTRACT

This study determined the species list and status of mammals and birds in Chingurmi-Duguma Sector of Chad Basin National Park. The implication of residents' attitude and perception towards the park project that may have influence on the status of mammals and birds in the park was also investigated. Species list of mammals and birds were determined using direct sighting, interviews, indices, bush meat market surveys and literatures. Status categories assigned were based on information from the residents, hunters and bush meat sellers in the support zone in comparison to literature. Random sampling method was employed to administer questionnaire to elicit information from the local residents on their awareness of the values and support to the existence of the park. Linear correlation was used to analyze the relationship between respondent's awareness of the park values and their support for the existence of the park. Results obtained shows that a total of twenty –one (21) species of mammals and twenty-five (25) species of birds were inventoried. The awareness of the park values by the local residents was high (74.29%) and that their attitudes and perceptions towards the park was negative with some respondents (65.71%) calling for the abolition of the park. There is no relationship between the respondents' awareness of the park values and their support for the existence of the park project. The negative attitudes and perceptions of local residents might have resulted to the low status of mammals and birds. Factors suggested by the local residents that could elicit their support for the park project include employment, and provision of pipe-borne water, road, health facilities and schools in addition to participation in the management of the park. It is therefore recommended that the park management should implement measures suggested by the local residents to get their support for the realization of the objectives for which the park was established.

**Key Words:** Mammals, Birds, Species lists, Status and Residents.

## INTRODUCTION

National parks like other protected areas play a vital role in the conservation of biodiversity (IUCN 2004). For conservation of biodiversity in protected areas to be effective, knowledge of the species composition and their status in time interval is very important. The status of a population of any individual species is crucial information to the wildlife ecologist because this information determines individual fitness for its environment and also predicts their ultimate success or failure (Usher, 1992). Knowledge of the relationship between wildlife population and their habitat is required for the development of appropriate management strategies for such population for the purpose of their perpetuation (Dunn, 1993).

Chingurmi –Duguma Sector of Chad Basin National Park was established in 1991. According to Ezealor (2002), it was identified as an Important Bird Area (IBA) in 1996 by Nigerian Conservation Foundation (NCF) with its foreign partner NGOs; the Royal Society for the Protection of Birds (RSPB) and Worldwide Fund for Nature (WWF). The IBA programme is a global conservation initiative that uses birds as a common index for identifying places of high biological diversity.

A National Park is often judged on the number of species that it contains especially mammals, birds, fishes and plants and hence requires monitoring and evaluation (Akosim *et.al*, 2008). Among the outstanding wildlife species in National Parks are mammals and birds and are considered the star species of attraction for ecotourism (McShane, 1996). This situation therefore calls for monitoring in order to measure changes in their abundance which is of major significance to management. Management Programmes of National Parks according to Marguba (2002) should include what he referred to as Support Zone Community Programme in which communities living around the park are provided with educational and health facilities as well as infrastructures such as roads, pipe-borne water and electricity. Employment opportunities and local participation are also expected to be part of the benefits desired by local people from the management (Alexander, 2000).

This study was to update the basis for the management of the resources of the park and to proffer solution to the deliberate illegal exploitation of the park resources by the local people. Hence, the study aimed at providing information on the current species composition and status of mammals and birds in the park with regard to the attitudes and perceptions of local residents towards the park.

## MATERIALS AND METHODS

### The Study Area

Chingurmi-Duguma sector of the Chad Basin National Park is situated in Woloji and Gulumba Districts of Bama Local Government Area of Borno State, Nigeria. It was first established as a Forest/Game Reserve in 1975 under Borno Province. It covers an area of about 1,228Km<sup>2</sup>. The sector is contiguous with Waza National Park in the Republic of Cameroon. Geographically, it is located between latitude 11<sup>0</sup>.30'-12<sup>0</sup>00' N and longitude 13<sup>0</sup>30'-15<sup>0</sup>00'E.

The climate is broadly characteristic of the Sahel Savanna Zone. Dry arid types of climatic conditions are experienced, with mean annual temperature range between 28<sup>0</sup>C-39<sup>0</sup>C (CBNP, 2000). However, the maximum

temperature rises to over 48<sup>0</sup>C at the onset of the rains. The coolest temperature is recorded between December and February during the harmattan period with mean temperatures of 20<sup>0</sup>C-23<sup>0</sup>C. The area is characterised by two seasons; a long dry season and a short wet season.

The vegetation can be described as an association of *Acacia* and *Combretaceous* scrub with virtually little or no trees in the area. Common plant species are mainly *Acacia senegal*, *A. nilotica*, *A. seyal*, *A. radiana*, *A. sieberiana* and *Faidherbia albida*. Others are *Balanites aegyptiaca*, *Pilostigma thonningii*, *Combretum* spp; *Guirrea senegalensis*, *Ziziphus Mauritius* and *Dichrostachys cinerea*. Few trees of *Tamarindus indica* and *Parkia biglobosa* dotted the scenery. Grasses are mostly annuals, which include *Sorghum aethiopum*, *Cenchrus biflorus*, *Aristida* spp, *Pennisetum pedicellatum*, while perennial species are, *Andropogon gayanus*, *Hyperhenia* spp and *Loudetia* spp, found along the seasonal streams. There are also herbaceous plants like the *Cassia tora*, *Hyptis suaveolens*, *Tridax* spp, *Triumfetta rhomboidea* and *Aeschynomene indica*.

## Data Collection Techniques

Methods used in identifying species in the study area are as follows:

- a. Interviews:- The participatory rural appraisal method as described by Agbelusi (1995) was used to elicit information on wildlife species composition in the area.
- b. Indices:- This follows Koster and Hart (1988) method in which population's studies must rely on the interpretation of animal signs, hunter bags, spoor; feeding signs and activities.
- c. Market surveys:- Bush meat in the local markets in the vicinity of the park were identified.
- d. Other methods used to identify species of the study area include direct observation and literature review.

Questionnaire was administered to the heads of households only on their awareness of park values and support to the existence of the park among others. Random sampling technique was adapted to select 5 respondents in each community totalling 35 in the study area. The communities are Aka, Amchaka, Chingurmi, Gulumba, Jamusa, Kash-Kash and Sharaba.

## Data Analysis

Species list and status of mammals and birds were presented in tables. Categories outlined by Ezealor (2002) were used to assign the status of mammals and birds, viz: Vu- vulnerable (likely to become endangered if the factor that is posing threat persist); NT- Near threatened (species is approaching the thresh hold of vulnerability); EN- endangered (species is unlikely to survive if the factor that is posing threat persists); LR/cd- low-risk-conservation dependant (species in no immediate danger but survival will depend on implementation of effective conservation measures in its range); RB- resident breeder; R(B)- residents but breeding not approved; PM- Pale arctic migrant; Afm- migrates within Nigeria and DD- data deficient.

Residents' attitudes and perceptions towards the park project was analysed using descriptive statistics involving percentage, frequencies and tables. It was used to analyze frequencies of respondents' in relation to the factors

that influence residents' attitude and perceptions towards the park. Linear correlation was used to analyze the relationship between respondents' awareness of the park values and their support for the existence of the park.

## RESULTS

Tables 1 and 2 show the species list of mammals and birds, their mode of identification and status. Information from literatures and interview of hunters revealed that all the birds and mammals listed are found in the park. A total of twenty-one (21) species of mammals and twenty-five (25) species of birds were listed. Seven (7) and twenty –one (21) species of mammals and birds respectively were identified by direct sighting in the park. Twelve (12) species of mammals and Nine (9) of birds listed were present at bush meat processing and selling centers in local markets in the area.

**Table 1:** Species List, Method of Identification and Status of Mammals in Chingurmi-Duguma Sector of Chad Basin National Park

Species Common Name	Scientific Name	Method of Identification				Status
		DS	INF	INT	PC	
Giraffe	<i>Giraffa camelopardalis</i>	X	X	X	X	Vu
Hartebeest	<i>Accelaphus buselaphus</i>	-	X	X	-	Vu
Elephant	<i>Loxodonta africana</i>	-	X	X	X	En
Red-fronted Gazelle	<i>Gazella rufifrons</i>	X	X	X	X	Vu
Spotted Hyena	<i>Crocuta crocuta</i>	-	X	-	-	Nt
Jackal	<i>Cervis aureus</i>	x	X	X	-	En
Serval cat	<i>Felis serval</i>	-	X	X	-	LR/cd
Bushbuck	<i>Traglophus scriptus</i>	x	X	X	x	Vu
Red-patas monkey	<i>Erythrocebus patas</i>	-	X	X	-	Vu
Ground Squirrel	<i>Epixerus epii</i>	x	X	X	X	LR/cd
Dorcas Gazelle	<i>Gazella dorcas</i>	-	X	X	X	En
Yellow backed duiker	<i>Cephalephus sylvicultor</i>	-	X	X	-	En
Kob	<i>Kobus kob</i>	-	X	X	X	En
Oribi	<i>Ourebia ourebi</i>	-	X	X	-	En
Roan Antelope	<i>Hippotragus equinus</i>	x	X	X	X	En
Wart hog	<i>Phacochoerus aethiopicus</i>	-	X	X	X	E
Hare	<i>Lepus capensis</i>	x	X	X	X	LR/cd
Lion	<i>Panthera leo</i>	-	X	X	-	DD
Leopard	<i>Panthera padus</i>	-	X	X	-	DD
Buffalo	<i>Syncerus cafer</i>	-	X	X	X	En
Hedhog	<i>Atelerix spiculus</i>	-	X	X	x	Vu

**In the table above and subsequent Table:** DS = Direct Sighting, INF = Information from Literature and Residents, INT = Interview of hunters, PC = Bush meat processing and selling centers, - = Absent and X = Present.

**Table 2:** Species List, Method of Identification and Status of Birds in Chingurmi-Duguma Sector of Chad Basin National Park

Species Common Name	Scientific Name	Method of Identification				Status
		DS	INF	INT	PC	
Grey heron	<i>Ardea cineria</i>	X	x	X	X	RB
Great egret	<i>Egretta alba</i>	X	x	X	X	RB
White stork	<i>Ciconia ciconia</i>	X	x	X	X	RB
Black stork	<i>Ciconia nigra</i>	X	x	X	X	RB
Cattle egret	<i>Bubulcus ibis</i>	X	x	X	-	RB
Marabou stork	<i>Leptoptilos cruminiferus</i>	X	x	X	-	RB
Sacred ibis	<i>Threskionis aethiopica</i>	X	x	X	-	RB
Spur-winged geese	<i>Plectropterus gambiensis</i>	X	x	X	X	R(B)
African fish eagle	<i>Haliaeetus vocifer</i>	X	x	X	-	PM
Helmeted guinea fowl	<i>Numuda meleagris</i>	X	x	X	-	RB
Black kite	<i>Milvus migrans</i>	X	x	X	-	RB
Double spurred francolin	<i>Francolinus bicalcaratus</i>	X	x	X	X	RB
Ruff	<i>Philomachus pognax</i>	X	x	X	-	RB
Woodland kingfisher	<i>Halcyon senegalensis</i>	X	x	X	X	V
Garganey	<i>Anas guerguedula</i>	X	x	X	X	R(B)
Hadada ibis	<i>Bostrychia hagedash</i>	X	x	-	-	RB
Ostrich	<i>Struthio camelus</i>	-	x	X	-	RB
Secretary Bird	<i>Sagittarius sepentarius</i>	-	x	X	-	RB
Abyssinian ground hornbill	<i>Bucorvus abyssinicus</i>	-	x	X	-	LR/cd
Vulture	Family: <i>Aegyptidae</i>	-	x	-	-	LR/cd
Cuckoo	<i>Cuculus canours</i>	X	x	X	-	RB
Stone partridge	<i>Ptilopachus petrosus</i>	X	x	X	-	RB
Laughing dove	<i>Stimato-pelia senegalensis</i>	X	x	X	-	RB
Weavers	<i>Ploceus spp</i>	X	x	X	X	RB
Common swift	<i>Apus apus</i>	X	x	x	-	RB

Table 3 shows the awareness of the values of the park by the people living around the park. Respondents that were aware of the values of the park were 5 each in Amchaka and Chingurmi; 4 each in Gulumba and Jamusa; Aka and Sharaba, 3 each and 2 in Kask-Kash making up to 74.29% of the respondents. Respondents that were not aware of the values of the park were 3 in Kask-kash; 2 each in Aka and Sharaba; and 1 each in Gulumba and Jamusa giving 25.71% of the respondents.

**Table 3:** Awareness of the Values of the Park Project.

Communities	Those Aware of the Park Values	Those not Aware of the Park Values
Aka	3	2
Amchaka	5	-
Chingurmi	5	-
Gulumba	4	1
Jamusa	4	1
Kask-Kash	2	3
Sharaba	3	2
<b>Total</b>	<b>26</b>	<b>9</b>
<b>Percentage</b>	<b>74.29</b>	<b>25.71</b>

Result of the respondents' perception on whether the park is a good project or not is presented in Table 4. Respondents that were of the opinion that the project is a good one in Jamusa, Kask-kash, Amachaka, Aka, Sharaba and Gulumba were 1,2,2,3,3 and 4 respectively constituting 42.86% and those that were of the opinion

that it is a bad project came from Gulumba, Jamusa, Aka, Kask-kash, Sharaba Amchaka and Chingurmi communities and were 1,2,2,2,3 and 5 respondents respectively making up 45.71. Respondents that were undecided on whether the park is good or bad project came from Jamusa and Kask-Kash communities and were 3 and 1 respectively and constitute 11.43% of the respondents.

**Table 4:** Showing Respondents' Perception on whether the Park is a Good or Bad project.

Communities	Good	Bad	Undecided
Aka	3	2	-
Amchaka	2	3	-
Chingurmi	-	5	-
Gulumba	4	1	-
Jamusa	1	1	3
Kask-Kash	2	2	1
Sharaba	3	2	-
<b>Total</b>	<b>15</b>	<b>16</b>	<b>4</b>
<b>Percentage</b>	<b>42.86</b>	<b>45.71</b>	<b>11.43</b>

Results of the respondents' attitude toward the existence of the park are presented in Table 5. Respondents who support the existence of the park were 2,2,2,3 and 3 in Aka, Kask-Kash, Sharaba, Amchaka and Gulumba communities respectively constituting 34.29% while those that want the park abolished were 2,2,3,3,3,5 and 5 in Amchaka, Gulumba, Aka, Kask-Kash, Sharaba, Chingurmi and Jamusa respectively and made up 65.71% of the respondents. There is no relationship between the awareness of the respondents of the park values and their support for the existence of the park project.

**Table 5:** Showing Respondents who do support the existence of the park and those who do not.

Community	Do support Park Existence	Do not support Park Existence
Aka	2	3
Amchaka	3	2
Chingurmi	-	5
Gulumba	3	2
Jamusa	-	5
Kask-kash	2	3
Sharaba	2	3
<b>Total</b>	<b>12</b>	<b>23</b>
<b>Percentages</b>	<b>34.29%</b>	<b>65.71%</b>

Table 6 shows the development options that the park management has to provide to elicit the support of the residents. These include: Employment (21.77%), pipe borne water (20.41%), Road (15.65%), Electricity (11.57%), Farm Land Areas (2.04%), Agricultural Inputs (5.44%), Health Facilities (8.84%), Schools (6.12%), Viewing Centers (5.44%) and community woodlots (2.72%).

**Table 6:** Development Options Influencing Respondents' Support for the Park Project

Development Options	Frequency	Percentage
Employment	32	21.77%
Pipe borne Water	30	20.41%
Road	23	15.65%
Electricity	17	11.57%
Farm land areas	3	2.04%
Health facilities	13	8.84%
Agricultural inputs	8	5.44%
Schools	9	6.12%
Viewing center	8	5.44%
Community woodlots	4	2.72%
<b>Total</b>	<b>147</b>	<b>100%</b>

Results of willingness to participate in the management of the park project by the local residents are presented in Table 7. The result indicates that 74.29% were willing to be involved, 11.43% were not willing and 14.28% were undecided.

**Table 7:** Willingness to Participate in the Management of Chingurmi-Duguma Sector of Chad Basin National Park by the Residents.

Community	Willing to Participate	Not willing to participate	Undecided
Aka	2	2	1
Amchaka	5	-	-
Chingurmi	5	-	-
Gulumba	4	-	1
Jamusa	5	-	-
Kask-kash	2	1	2
Sharaba	3	1	1
<b>Total</b>	<b>26</b>	<b>4</b>	<b>5</b>
<b>Percentages</b>	<b>74.29%</b>	<b>11.43%</b>	<b>14.28%</b>

## DISCUSSION

The twenty one (21) mammalian species are about 8.50% of the 247 mammalian species reported for Nigeria (Marguba, 2006), and twenty –five (25) bird species are about 2.80% of the 904 bird species reported for Nigeria (Ezealor, 2002). The relative low species richness of the park might not be unconnected with the size (1228 Km<sup>2</sup>) which is relatively small compared to the size of Nigeria (923,766km<sup>2</sup>) This observation agrees with Usher (1992) and Laurence *et.al*, (2000), report, that species diversity is often affected by the size of habitat and that diversity is positively correlated with habitat size. The high incidence of poaching in the park might have also contributed to the low species richness. This is true because high hunting pressure could lead to local extinction through either total extermination or migration.

The poor status of the mammalian and bird species is an indication of the eruption of latent hostility of those who had been expropriated, displaced and then ignored. The local population is systematically slaughtering the wildlife as an act of vengeance. The proper solution is undoubtedly to consider and adopt some of the suggestions made and to increase their sense of responsibility. Basic socio-economic infrastructures should be established in the communities near the protected area. Assistance should be provided so that the land bordering

the protected area can be utilized, thus integrating the local people into the park protection. Serious thought should also be given to the participatory management of the park.

Whilst most local residents (74.29%) understood the intrinsic, aesthetic and material values of the park project, some of the members (65.71%) were dissatisfied with the project and were of the opinion that it should be abolished. Besides, 42.86% of the respondents who were of the opinion that the project is good are in the minority. This latent hostility must have been caused by the project inability to attract the necessary infrastructures and social amenities expected from it to their communities. Furthermore the park project seems to have been immensely harmful for the local populations through the loss of hunting ground and therefore loss of protein for the rural populations, loss of grazing lands and abandonment of productive farm lands. There is therefore that feeling of expropriation, displacement and then being ignored. Similar observation was reported for protected areas in Togo (Tchamie, 2000) of deliberate destruction by local people of natural resources as an evidence of conflict between government programmes on people's needs. Results obtained clearly showed that provision of basic social amenities would go a long way in checking the problem of trespassing in the park. The local needs are dominated by five (5) main requests: employment, pipe borne water, roads, electricity and health facilities.

A significant number of the respondents (74.29%) were willing to be involved in the management of the park. In line with respondents' suggestion, the park management should without delay actualize the participation of the local residents in the management of the park through employment, formation of local committees, appointment as informants and formation of youth clubs in the support zones. This agrees with the recommendations of Alexander (2000) for the conservation of black howler monkeys in the community Baboon Sanctuary in Belize. The low status of mammals in the Chigurmi-Duguma Sector of Chad Basin National Park might not be unconnected to the low support of the local communities living around the park. The residents do not only poach on the park resources but also accommodate commercial and elite-weekend hunters providing them with relevant information on where to get the animals and movements of the park rangers.

## CONCLUSION

From the results, it can be concluded that most people of the support zones of the park are sufficiently aware of the values of the park. Local residents' perceptions and attitudes are currently on the negative side but can be reversed by providing the communities with essential social amenities. Participation of the local people in the management of the park was found to be very vital for long-term survival of the park. The negative perception and attitudes of local residents were found to be expressed in their rate of trespass into the park and poaching which in turn have resulted in low status of mammals and birds. As a biological "hotspot", it is expected that species diversity and status are high compared to the results obtained in this study.

In view of these findings, the following recommendations are made for the sustainability of the resources and livelihood of the people:

- a. Effort should be made by the park management to create alternative means of livelihood for the youths of the local residents, provide basic social amenities such as schools, health-clinics, roads/bridges.



- b. Scientific method of farming and utilization of land bordering the protected area should be taught to the residents. This will further make them feel integrated in the park project protection processes. Agricultural inputs should also be provided.
- c. The park management should ensure that the local residents are adequately involved in the management of the park through direct employment, appointment as liaisons officers, informants and formation of committees and youth clubs in the support zones.

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