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Comparative Analysis of Fauna Numerical Characteristic of Yankari Game Reserve from 1980-2008

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Abstract: The study of the numerical characteristics of some selected Mammals of Yankari Game Reserve (YGR) was conducted with a view to making comparison with what existed in the 80's. Road Side Count Method was used for the inventory of individual species using specially designed form administered by a volunteer during the game viewing trip. In-depth interviews and questionnaires were administered to Patrol Guard Rangers and Peri-game reserve dwellers to elicit information on the trend of encroachment into the reserve. Data obtained were analyzed using descriptive statistics. The study revealed a decline of -58.55% of animal species sighted in the reserve between 1979/80-2008, indicating 0.2% annual decline. It was also observed that predation and epizootic diseases contributed significantly to the decline of the reserve fauna resources. Other factors responsible for the decline of the animal species include poaching and increasing pressure emanating from the Internally Displaced Persons (IDP'S) settling <1 km around the reserve boundary. In addition however, the reserve had experienced over the years prolonged unresolved administrative bottleneck, which further compound the reserve conservation problems. To rescue the remaining animal species and to alleviate the identified conservation problems in YGR. Government, NGO'S and the Reserve Management should consider and encourage the need for increased support zone community development projects, intergretated participatory management that enunciate bottom-up conservation process and re-settlement of the recently established hamlets that are proximate to the reserve boundary among others.

Key words: Encroachment, species, predation, poaching, conservation

INTRODUCTION

Today there are some 30,000 protected areas around the world covering about 12.8 sq million km, which amount to 9.5% of the planet land area (IUCN, 1992). Nigeria on the other hand with an area of 923,768 km is characterized with varying ecosystem ranging from forest in the south, which occupied 9.61% of the country land area, through moist Savanna in the central and arid dry savanna in the extreme north covering 48.53% of the country land area. Wetlands and Fresh water ecosystems, brackish and marine ecosystems occupied 20.2 and 1.03%, respectively. These ecosystems however, house over 5000 plant species and over 22,094 species of animals including insects and over 889 species of birds and 1,489 species of microorganisms. The figure ranked Nigeria the 8th highest African Country blessed with abundant and complex fauna resources (Comesky, 2000). Among the 4,614 species of plant recorded in Nigeria, 490 species were considered locally threaten while 146 species were globally threatened (Gbile *et al*., 1978; IUCN, 2002). Similarly, IUCN (2003) also reported 148 species of animals in Nigeria that are globally threaten. Of these value 26 species of animals and 18 species of plants are considered endangered and another 3 animal species and 15 plant species were considered critically endangered worldwide. Invariably, all these species of fauna and flora in varying status are housed in 1,174 protected areas across the country located in 49 strategic places in the 36 state of the federation. These include the 7 National parks, 1129 Forest reserve, 2 Strict nature reserve and 31 game reserve, 4 Game sanctuary and also 1 Biosphere reserve (Lawan, 2002). In spite these number of protected areas in Nigeria pressure emanating from the growing number of population and the pervasive poverty particularly in the rural communities have exposed the country's biological resources to a great threat. More importantly, the over reliance of the country on the Natural resources have rendered Nigerian Wildlife resources venerable to extinction.

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Yankari Game Reserve is one among the country's premier Game reserve, it covers a total land area of 2,244.10 km^2 surrounded by over 200 host communities within the range 1-5 km^2 (Aaron, 1993). The reserve holds a significant proportion of the country's fauna resources, with about 52 different species of mammals including 17 species of reptiles, 7 amphibians and 26 species of fish and over 300 species of Avian fauna (Sikes, 1964; Green and Amance, 1987). However over the year, the reserve has been stressed with all kind of pressures emanating from religious and political crisis around the support zone communities of the reserve and the neighboring local Government areas, coupled with prolonged unresolved administrative crisis between the State Government and the Federal Government, logistic and technical setback, in addition to increasing poverty among the peri-Game reserve dwellers. More so, the reserve experienced the outbreak of epizootic diseases (rinderpest) in 1983/84, which exposed the wild animal population of the reserve to severe habitat and population decline. Thus, the life of so many valuable species of fauna and flora in the reserve were endangered. The study investigates the numerical characteristic of some selected fauna species of the reserve with a view to comparing it with what existed in the past, 1979/80.

MATERIALS AND METHODS

The survey of the fauna species of the Yankari Game reserve was conducted during the January 1st spanning through July the 31st, 2008. Animal species were censused using road side count method (Marshal, 1985; WWF, 2000). The survey was scheduled during the normal game viewing trip officially designated morning (7.30 am) and evening (3.30 pm) on daily basis in the reserve. An ordinary game viewing trip takes about 2:30 h and covers approximately 40 km via Robert Caulthered way at the North, Guruntun bridge at the South, Adamu Jumba at the East and Fadaman Makka at North East (Fig. 1).

The choice of the route was however, informed by the knowledge of ecology of the reserve, where animal distribution is influenced by the centrally located perennial Gaji River, which transverses the reserve from north to south fed in by a number of cool and warm springs as tributaries. Similarly, the choice of the direction of the trip on daily basis varies at the discretion of the guide who is familiar and acquainted with the reserve and the animal movement. Individual animals seen were inventoried and recorded using special form produced in two international languages English and French administered by one volunteer among the tourists on each trip, a clip-board, pencil and eraser were provided for ease of writing while enjoying the wilderness. The tourist who filled in the forms with great deal of enthusiasm returned the form at the end of each trip. At the end of every month the forms are collected and sorted to morning and evening and the average number of each species seen every month was calculated and analyzed using descriptive statistics.

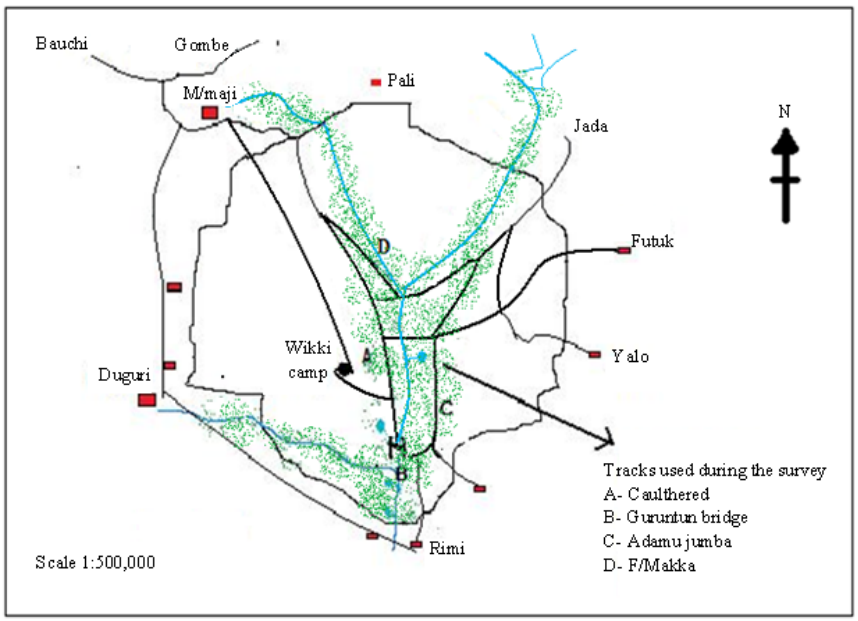

Fig. 1: Map of yankari game reserve showing the study site (1979/80:2008)

RESULTS AND DISCUSSION

The findings in Fig. 2 shows, there was a shape decline of animal population in YGR within the last 28 years (1980-2008). Species mostly affected were the herbivores. Record from the Game Preservation Unit of the reserve (GPU) shows that except the case of 1983/84 rinderpest when the reserve suffered epizootic disease, there was no incidence of epidemic in the reserve. During the 1983/84 outbreak, several hundred of ungulate species (buffalo, warthog, roan antelope etc.) were severely affected. Jackie and Whiney (1989) reported that only 25 Buffalos survived the disease in the reserve, while statistics of other species affected were unknown.

A number of factors may be responsible for these decline of animal species population in the reserve. The reserve management suffered four years (2002-2006) series of transition between Federal Government and the State Government and also inter ministerial professional management conflict within the state, which hinders effective supervision. The agitation of the State Government to return the management of the reserve to its former status (Game reserve) and the Federal Government Political unwillingness to relinquish the Park to the state, which took quite some time (4 years) had subjected the wildlife of the reserve to severe poaching stress. Protection staff as well as other supporting staff were held to ransomed, salaries were not paid and when paid, not as and when due. The reserve lacked appropriate surveillance, existing protection equipment were all grounded, new ones were not forth coming and the only surviving Toyota Hilux was limited as a means of patrolling the 2,244.10 km^{-2} long boundaries of the reserve.

Thus, protective soldiering of the reserve also turned to be poaching during the 4 years transition. The reserve became porous, larger herbivores (big game) were badly poached, data collected from the litigation unit of the protection department of the reserve revealed that poaching became worst during the transition period as indicated in Table 1. Duguri district held the highest number of poachers per annum with 46.12% in about 5 years, while Pali district held the least with 16.71% and Duguri district 37.12% (GPU, 2004-2008). Other factors responsible for the decline of animal species in the reserve over the years may be due to increasing number of Internally Displaced Persons (IDP's) (environmental refugees) in the surrounding communities (SZC). Ibrahim and Mohammed (2005) reported that over 65% of the inhabitants of the SZC were immigrants who fled their home land due to marked environmental disruption and came to settle around the reserve perimeter in search of rich alluvial soil for agriculture. Table 2 shows the

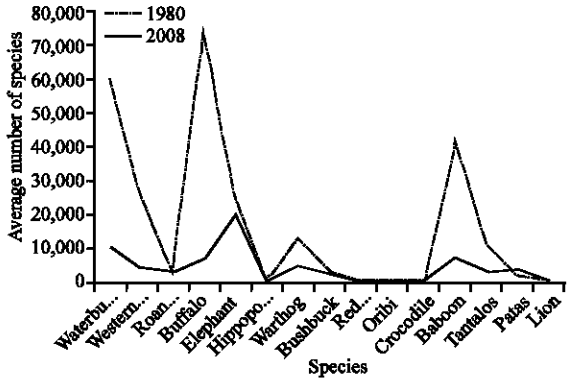

Fig. 2: Average number of animal species sighted per month in YGR Jan-July 1980 and 2008

Table 1: Number of poachers arrested and convicted per district per year in YGR 2004-2007

Years	Pali	Duguri	Gwana	No. of arrested/annum
2004	15	44	44	103
2005	31	49	50	130
2006	21	46	37	104
2007	4	47	12	63
2008*	1	13	17	31
Total	37.12%	46.17%	16.1%	431

2008* January-July; Adopted and mogified GPU (2004-07) (Litigation unit annual report)

Table 2: Trend of villages per district that were within 1-5 km range from YGR boundary

Districts	Villages established before the GR	Villages established after the GR (1955-85)	Existing villages
Duguri	28*	34	117
Gwana	11	40	185
Pali	10s	18	65

*Two villages (Buri and Zanbu) were relocated due to 1970/71 Northern Boundary extension and the inhabitants were dispersed to other communities (Machido, Badara-Lungu, Badaromo Gungu Gyar and Rafawa); Source: Min of Land and Survey (1968), Field Survey, 2008

trend of village's continual increase over the years since the creation of the Reserve in early 50 sec with Gwana district having the highest number of communities that fall within 1-5 km range from the boundary and Pali district having the least number of newly established communities. Toepfer (2005) noted that presence of large number of IDP'S near protected areas are bound to generate direct and strong perturbation on the wildlife resources of the host communities. Thus, as rightly observed by Toepfer (2005), the arriving of such IDP'S into the new habitat, the refugees are often faced with hunger, fatigue and aggrieve; their first concern is to look for shelter and food which involve poaching and hunting wildlife (fauna and flora).

The trend is observable in YGR where deforestation (due to agriculture and Settlement activities) around the Game Reserve boundary is on the increase leading to the lost of wild animals habitat. These phenomena triggered

Table 3: Number of each species of animals sighted per month January-July 1979/80 and 2008

	January		February		March		April		May		June		July	
Species	1980	2008	1980	2008	1980	2008	1980	2008	1980	2008	1980	2008	1980	2008
Waterbuck	840	630	9600	1485	12600	2477	8600	2428	1500	1105	4000	1432	2200	1012
Western Hartebeest	2600	77	4200	608	6400	723	6400	932	1600	523	2400	691	1000	520
Roan Antelope	880	30	620	404	760	193	380	932	340	544	500	922	280	140
Buffalo	9400	115	14600	885	15800	1404	16000	1568	11000	322	4800	1305	2400	1010
Elephant	3800	685	4200	2737	4000	1045	7600	2068	3200	744	2000	2832	600	891
Hippopotamus	144	0	124	11	136	75	112	140	228	66	20	113	68	60
Warthog	1480	92	1520	578	2120	600	2600	608	1920	700	1440	1079	1600	1200
Bushbuck	420	262	460	374	580	371	510	204	720	650	390	259	110	98
Red flank duiker*	-	0	-	37	-	52	-	40	-	150	-	69	-	38
Oribi*	-	0	-	0	-	30	-	60	-	89	-	83	-	21
Crocodile*	-	0	-	189	-	119	-	96	-	61	-	110	-	72
Baboon	7400	77	5800	1311	6600	1130	8000	1240	6200	1244	6400	1491	1400`	1020
Tantalus Monkey	1720	23	1200	566	1880	652	2240	676	2600	445	1120	279	520	311
Patas Monkey	200	31	220	726	470	1300	370	892	250	200	110	596	110	60
Lion	58	0	84	37	74	38	100	88	46	67	56	90	16	4

*Species not included in 1979/80 census; Marshell,1979/80: Field Survey, 2008

the onward migration of some wild animal's species that are endemic to the Game reserve as well as death of other species that were ecologically niche to a particular habitat around the reserve perimeter. These include Percupine, Spotted Hyena (*Crokuta-crokuta*) and Grass Cutter (*Trinomis swendirianus*).

Similar trend was evident in Democratic Republic of Congo (DRC, formerly Zaire) since 1994, where 3,750 ha of forest land was lost in Kivu region within 3 weeks of the arrival of refugees (Toepfer, 2005). In similar trend, a survey in western Tanzania revealed that IDP's used an average of 2.8 kg of wood per person per day, where as local host communities used just 1.7 kg per person per day.

Reason for such difference was the fact that IDP's were found to rarely put out fires between meals due to lack of matches and they used mostly dry food substances which took longer time to cook than fresh food. Other factor, which can be seen from the Fig. 1, is predation. Lion population in the reserve seems to be stable with no significant changes in population since 1980 (Table 3). Thus, the sharp decline of herbivores population in the reserve could be attributed to the lion population.

Similarly, lack of research and monitoring of the reserve resources rendered some of the wildlife species of the reserve vulnerable to all sort of human intimidations thereby forcing many of these species to migrate and become locally extinct, while others become threaten and endangered unnoticed. For example gazelle, Leopard (*Panthera pardus*), Water chevrotain (*Hyemoschus aquaticus*) and the Giraffe (*Giraffe camenlopordalis*) of Yankari Game Reserve become rare than a blue moon, they appeared only on postal stamp and on memory.

CONCLUSION AND RECOMMENDATIONS

This study have shown that the surviving animal species in Yankari Game reserve are under intense pressure of hunting, habitat alteration and habitat loss mainly due to continuous influx of Internally Displaced Persons (IDP's) and increasing settlements around the reserve perimeter resulting to overutilization of reserve resource and nature interference in varying categories, ranging from illegal entry, livestock grazing, fruits/seed collection, fuel wood collection to mining and bush burning. These have caused the reserve to loss grip of some substantial number of animal species, while some even extinct from the reserve. Despite the existence of state legistilation and the ongoing GEF/LEEMP project interventions which are intended to alleviate poverty and improve the living standard of some communities surrounding the Yankari Game reserve, their exploitative act seems to continue on a more or less large scale. This is attributed to the consequences of poor state of design and implementation of conservation programmes by the reserve management vis-avis the nongovernmental organization NGO'S on support zone community programmes. Schemes which are designed to improve the living standard of people should be properly designed, monitored and implemented. Sharing of economic gain accrued from the small scale enterprises introduced by GEF/LEEMP project aimed at inculcating social cohesion among community members seems to have generated social disunity among communities. Thus, some of the benefiting communities view the interventions as a means of further compounding their social problems rather than to alleviate. Hence, community's base projects must involve intensive dialogue and integrated indigenous

knowledge system as a measure to reduce social risks. However, if the observed trend of animal mortality in the reserve is allowed to continue unchecked, the reserve has the potential of depleting to the status of a desert within unforeseeable future. Therefore, Government, Nongovernmental Organization, Professionals Bodies and all relevant stakeholders should have to consolidate their efforts toward rescuing the reserve and the remaining Fauna and Flora resources before the situation gets out of control.

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