ASSESSMENT OF HUMAN ACTIVITIES IN NIGERIA WILDLIFE PARKS

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ABSTRACT

A study was carried out in Plateau state (Pandam Wildlife Park) with the aim to consider the interplay between Park resources and anthropogenic activities in the environs of the Park. Ten (10) plots of size 50m x 50m were sampled within the buffer zone of the park. In each plot, farmlands were measured and the numbers of tree stumps were counted. Vegetation assessment was carried out using the point quarter method. Diameter of standing trees and height were also taken. In all the plots sampled, farm size and the rate of logging activities were tabulated. Tree diversity index was calculated using the Shannon Weiver formula. It was observed that various level of encroachment, wildfire, logging activities, agricultural farming and livestock grazing are taking place around the vicinity of the Park boundary. The number of tree stump observed in the sampled areas was recorded, diameters of standing trees were taken and records of various crops planted in farms within the sampled areas with few wild animals observed were noted. Human activities has adverse effects on the wild animal population, hence it has become difficult to sight wild animals within the park especially during the day. In order not to jeopardize the efforts of conservation in the Park, It was therefore recommended that: there should be more stringent laws to protect Park resources, the laws should be effectively enforced by the Park guards and Participatory Rural Approach method should be practiced by the management of the Park.

Key words: *Wild animals, Park resource, Conservation, human activities,*

Introduction

Wildlife management is the process of keeping certain wildlife population including endangered animals at a desirable level determined by wildlife managers. Wildlife management is interdisciplinary integrating science and logic. It deals with protecting endangered and threatened species and subspecies and their habitat as well as with non-threatened agriculture pest and game species (Leopold, 1993). The National Park concept involves the exclusion of people from wildlife area apart from visitors and employers with management. This is because human settlement may directly affect ecological carrying capacity and can also have profound effect on parks and reduces the population growth rate of wild animals through direct killing. The destruction of natural vegetation will also reduce the amount of food available to animals and so lower the individual intake, the destruction of range land and forage affect the survival of the wild animals thus reduce the carrying capacity of the protected area (Evans, 1999).

Indiscriminate fuel wood and other Non-Timber Forest Products (NTFPs) gathering, timber harvesting and overgrazing have aggravated land degradation in many parts of the tropics (Bene,

1977). At the global scale, the ecologically most significant human impact on vegetation is deforestation. The steadily increasing rate of deforestation is due to rapid growth of human population and urban expansion, persistent shifting cultivation, other agriculture practices and the pressure of increasing demand for forest products (Evans, 1999). Nigeria's natural forest resources are fast diminishing and forecasts are that they may be exhausted by the end of this century as many species of flora and fauna are threatened with extermination (Umed, 1985). As soon as the vegetation cover of the soil is removed, the protective influence of the forest is reduced to the barest minimum. Soil conservation and improvement values of the forest are immediately lost and erosion sets in.

Human impact on habitat resources of wildlife

For animals to survive in their habitat or be restored where they have been disturbed, man must be prepared to reserve a place for them to live. In other words, a suitable habitat must be provided, these suitable habitat refer to the maintenance or provision of the various habitat requirement through management. Over the years human impact on the habitat requirement for wildlife have been through various form of malpractice. Teleki (2004) reported the logging of *Afzelia africana, khyaya senegalensis, Termarindus indica* by the cattle Fulani men in Pandam Wildlife Park, we also have pagida and kwanbana Game Reserves, which provide cover and dry season browse able materials for wildlife. The effect of infrastructural development, industrial waste disposal and use of chemical on wildlife habitat have force some wild animals to migrate to other undisturbed habitat (Ayodele, 1988), the impact of human settlement will greatly affect the Game Reserves, this is because of the interference by the rural people on the wildlife resources of the Reserve.

Methodology

This study was carried out at Pandam Wildlife Park, Pandam Wildlife Park, is situated on the north eastern part of Nasarawa State and south western part of Plateau State. The Park is about 224square kilometer and was established in 1972 by the Plateau State Government, for the protection of rhinos. The relief and topography of the park ranges from 250ft (83m) and 500ft (167m) above the sea level. The study area is an undulating plain. The major streams that drain the park are: Dogo Kurmi and Dogo ruwa Streams; these streams are tributaries of River Guma which itself is a tributary of Dogo ruwa Stream. The dominant soils found in the study area are three and they include: Alluvia Soil – (mostly found at the plain streams). Clayed Loam Soil (mostly found at the sync lone.) and Sandy Soil (which is mostly found at the Anti-cline). The study area has a tropical climate with distinct dry and raining season. The climate is characterized by south western wind coming from the land of the Coast of Guinea. These are main bearing winds of the region. The wind prevails during the dry season, November – March and has – N.E. to N.S. direction. Rainfall during wet season is from April – October. Rainfall is about 1240mm and in the dry season, November to

March, the rainfall is about 154mm. The monthly mean temperature is about 29.5 ^{0}C.   The mean annual humidity at 12.00GMT is 60% and lowest monthly mean.

Vegetation, flora and fauna species in Pandam Wildlife Park

The vegetation of Pandam Wildlife Park is Guinea Savanna. It is characterized by the growth of shoots, grasses, thorns which grow rapidly reaching the height of 1.3 to 1.5 meters during raining season. The vegetation consists of open woodland with tall grasses as well, the trees are about 12m – 15m high and rarely up to 27m or 30m. The vegetation is destroyed almost annually by fierce fire in the dry season. Some of the tree species in park include; *Parkia biglobosa, Prosopis africana, Kyaya senegalensis,* among others. Pandam Wildlife Park has northern guinea savanna vegetation and therefore it contains most of the wild animal species typical of West African Guinea Savanna Zone. The Game Reserve has been subjected to heavy hunting pressure for long and therefore most of the present wild animals are very shy and unlikely to be seen in large number during the day time. Nevertheless some of the wild animal species that has been sited include: *Silvicapra grimmca, Lepus species, Erythrocebus patas, Cephalophus rufilatus, Cercopithecus aetheopes Xerus erythropus* among others

Method of data collection and analysis

Ten sampled plots were chosen at random along the periphery of the Park boundary; each plot measuring 50m x 50m (i.e. a total of 50m x 50m x 10plots = 25,000m^2). In each plot farmlands were measured and the numbers of tree stumps were counted. Vegetation assessment was carried out using the point quarter method. Diameter of standing trees and height were also taken. In all the plots sampled, farm size and the rate of logging activities were tabulated. Complete Randomized Design (CRD) was used to test the significant difference between the diameter classes of trees. Tree diversity index was calculated using the Shannon Weiver formula:

H = ΣPi x ΣLog Pi ………………………………. (1)

Where H = diversity index

and   Pi = proportion of each species

Results

Data collected from ten sampled plots measuring 50m x 50m each. The outskirt of Pandam Wildlife Park has been subjected to farming activities. The largest farm sizes are in Plot 4 and 1 covering land areas of 2500 and 1500 square meters respectively. And the least farm size is in plot 2 which covered 120 square meters. These farming activities have led to land degradation of the areas (Table 1). Cassava is grown in almost all the plots, it is a mixed subsistence cropping system that is practiced in the area (Table 2). Trees in the study area had been cut down either for Timber, Fuel wood or as a result of destructive farming activities. Farmers believed that trees found in their farmland located in the periphery of the Park hinder direct penetration of sunlight on their crops.

The result further shows the number of stumps and standing trees in the sampled plots. Plot 2, has the highest rate of logging activities having 56 numbers of stumps with only 7 standing trees. It also show the relationship between number of stumps and standing trees, and in all the plots, the number of stumps exceeds the number of standing trees (Table 1). The result of tree densities in the study area shows that less than 20% (0.00835) of trees are still standing in plot 9 that is sparsely populated and 25% (0.00165) of trees are still left standing in plot 1 that is densely populated with trees (Table 1). In each plot, vegetation assessment using the point quarter method was carried out. Plot 9 (9.14) had the highest distance between trees (i.e. more sparsely populated with trees) with Plot 1 (4.1) having the lowest distance between trees (i.e. more densely populated with trees). Less than 20% of trees are still standing in plot 9 that is sparsely populated and 25% of trees are still left standing in plot 1 that is densely populated with trees. Trees diversity index is highest in Plot 8 with 9.68 and lowest in Plot 1 with 0.94 respectively (Table 1).

The study furthers shows that the study area has diverse tree species there are seventeen (17) tree species in the sampled plots which actual population total up to 113. The percentage of each tree species in the study area is calculated as seen shown in table 4 *Terminalia shimperiana* and *Daniela oliverai* has the highest percentage of 15 and 12.4 respectively. *Mangifera indica* has the lowest percentage of 1 (Table 3).The diameter class of the trees ranges between class 1 (20.6 – 30.5) to 13 (140.6 – 150.5) with 10 trees counted in each class with variation in variance (Table 4). A total of 13 birds was sighted during the duration of the study (Table 5)

Discussion, Conclusion and Recommendation

Discussion

Pandam Wildlife Park has been subjected to farming activities contrary to the objective of its establishment. Most people surrounding the Park depend on mixed subsistent farming. Subsistent crops grown are Cassava, yam, maize, millets, groundnut, okra, guinea corn etc. Large area of land is cleared for agricultural purposes. These people living around the Park have greatly destroyed *Propolis africana* for commercial production of charcoal. According to (Clark et al., 1985) many civilizations have exploited the tropical rain forests converting the land for farming. Today, people rely on tropical rain forest for a variety of every day products. The immediate buffer zone surrounding Pandam Wildlife Park has been subjected to various degrees of farming activities. The study area has largest farm sizes in plot 4 and plot 1 covering land area of 2500 and 1500 square meters respectively. And the smallest farm size was found in plot 2 which covered land area of 120 square meters.

Animals in the study area are not easily sighted due to high hunting pressure. Only 6 bird species were sighted and a total number of 13 birds were counted altogether during the study period. Common garden Bulbul has the highest percentage of 30.7% while Grey plantain eater and Grey

wood pigeon has the lowest percentage of 7.6% respectively. According to Pearmsak (1980) Thailand wildlife is threatened by poaching, habitat loss and industries that sell wild animals as pets. Although there were about 100,000 elephants in the wild but it has dropped to an estimated 2,000. Poachers have hunted elephants for ivory, meat and hides to the point of extinction in Pandam Wildlife Park. Logging activities is high in the buffer zone of Pandam Wildlife Park, from Table 1, Plot 2 has the highest number of stumps (56) and Plot 10 has the least number of stumps (20) in the study area. Plots 4 and 7 has the highest number of standing trees with 15 trees each while Plot 5 has the lowest number of 4 trees. The result in 1 agrees with Bene *et al.*, (1977) who said that indiscriminate fuel wood gathering, timber harvesting and overgrazing have aggravated land degradation in many parts of the tropics.

Also, the findings of the study agree with Ayodele (1988) which says that the steadily increasing rate of deforestation is due to rapid growth of human population and urban expansion, persistent shifting cultivation, other agricultural practices and the pressure of increasing demand for forest products. Estimate of human population today vary substantially. However, it is generally accepted that global population between 1950 and 1987 exceeded five billion. Another million was added by 1988, with 90% of the growth occurring in developing countries (IUCN, 2007). The rapid human population growth accelerated by civilization has brought many problems to present day exploitation of wildlife resources. Tree density per hectare was highest in Plot 9 and lowest in Plot 1 with 0.00835 and 0.00165 respectively, these reflect the rate of logging activities in the area. Due to high logging activities in the study area, trees with diameter class between (120.6 – 130.5) cm are only two (2), (Table 5). There is significant difference among the diameter classes of trees. The percentages of tree in the study areas show that *Terminalia shimperiana* (15.0) and *Daniela oliverai* (12.4) have the highest percentages and *Mangifera indica* has the lowest percentage of 1. Tree diversity index in Plot 8 was 9.68 which are the highest and Plot 1 has 0.938 tree diversity index which is the lowest among the plots. According to FEPA (1996), virtually any form of sustained human activity results in modification of the natural environment; this modification will affect the relative abundance of plant species and in extreme cases may lead to extinction. Subsequently the populations of the wild animals are also adversely affected.

Conclusion

The study has shown that the condition perpetuated by those nefarious activities at the buffer zone of the reserve and even within the reserve if not checked will reduce the Park resources to a status that will not qualify the area as a reserve.

Recommendation

For efficient management and development of Pandam Wildlife Park to minimize illegal human activities in the reserve areas and its buffer zone the following recommendations are essential:

1   More power should be vested in the hands of the forest guards to apprehend any body found farming either in the Park or within the buffer zones surrounding the Park.

2   A more efficient anti-poaching patrol team should be recruited to mount guard and check poaching activities in the reserve.

3   Public awareness through extension service education should be encouraged.

4   Grazing land should be created with regular irrigation where cattle can graze without intruding into the reserve areas.

5   There should be a legalized penalty to be meted on caught domestic animals within the reserve.

6   Adequate training should be given to the available forest guards and their number should be increased.

7   Good accommodation should be provided for the forest guards at the camp for better performance of their duty.

8   The local people living around the reserve should be incorporated into the management of the Park, a participatory rural approach method.

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Table 1: **showing the land area, under cultivation at the outskate of the park, stumps and standing trees with their**

Plots	1	2	3	4	5	6	7	8	9	10
Farm Size (sq.m)	1500	120	200	2500	1400	250	1400	1350	720	800
No. of stumps	42	56	28	25	28	35	40	40	35	20
% of stumps	12	16	8	7	8	10	11	11	10	6
No. of standing trees	14	7	13	15	5	10	15	14	8	12
% of standing trees	12	6	12	13	4	9	13	12	7	11
Density	0.00165	0.00605	0.00599	0.00283	0.00293	0.002698	0.00334	0.00774	0.00835	0.0062
Average distance between trees	4.1	7.78	7.74	5.31	5.41	5.18	5.78	8.8	9.14	7.93
Tree Diversity Index	0.94	3.99	6.80	7.44	1.44	3.52	4.17	9.68	3.42	5.04

Percentages, Density, average distance per tree in the Study area and tree diversity index.

Table 2 **Types of Crops Cultivated in the Farms in each Plot**

Plots	Crops			
1	Cassava	Maize	Groundnut	
2	Cassava	Yam	Groundnut	
3	Maize	Groundnut		
4	Cassava	Maize	Okra	Millet
5	Cassava	Millet		
6	Cassava	Yam	Maize	
7	Cassava	Guinea Corn	Millet	
8	Cassava	Maize		
9	Cassava	Yam		
10	Cassava	Maize		

Table 3: **Tree Species in the Sampled Area**

S/No.	Tree Species	Population	Percentage
1.	*Parkia biglobosa*	6	5.3
2.	*Mangifera indica*	1	1.0
3.	*Prosopis Africana*	11	9.7
4.	*Daniela oliverai*	14	12.4
5.	*Terminalia shimperiana*	17	15.0
6.	*Anona senegalensis*	3	2.7
7.	*Lophira lanceolata*	4	3.5
8.	*Vitex doniana*	9	7.9
9.	*Etereospermum kunthiana*	2	1.8
10.	*Ficus benjamina*	4	3.5
11.	*Anogeisus leocarpus*	9	7.9
12.	*Kyaya senegalensis*	5	4.4
13.	*Sarcocephalus latifolus*	5	4.5
14.	*Afzelia Africana*	12	10.6
15.	*Combretum nigritana*	3	2.7
16.	*Sterculia setigera*	6	5.3
17.	*Brideria feruginia*	2	1.8
Total		113	100

Table 5 **Diameter Classes of Trees**

Class Interval (cm)	Count	Sum	Average	Variance
Class 1 (20.6 – 30.5)	10	3	0.3	0.23333
Class 2 (30.6 – 40.5)	10	12	1.2	1.28889
Class 3 (40.6 – 50.5)	10	3	0.3	0.233333
Class 4 (50.6 – 60.5)	10	15	1.5	1.611111
Class 5 (60.6 – 70.5)	10	6	0.8	0.844444
Class 6 (70.6 – 80.5)	10	9	0.9	0.544444
Class 7 (80.6 – 90.5)	10	8	0.8	0.622222
Class 8 (90.6 – 100.5)	10	34	3.4	2.488889
Class 9 (100.6 – 110.5)	10	3	0.3	0.455556
Class 10 (110.6 – 120.5)	10	10	1.0	0.444444
Class 11 (120.6 – 130.5)	10	2	0.2	0.400000
Class 12 (130.6 – 140.5)	10	2	0.2	0.400000
Class 13 (140.6 – 150.5)	10	6	0.6	0.933333
Total		113		

Table 6: **Bird Species Sighted during the Study**

S/No.	Common Name	Botanical Names	No.	Percentage
1.	Common garden bulbul	*Pycnonotus bartatus*	4	30.7
2.	Senegal coucal	*Centropus senegalensis*	2	15.4
3.	Grey plantain eater	*Crinifer piscator*	1	7.6
4.	Black headed weaver	*Ploceus melenocephata*	3	23.0
5.	Red headed love bird	*Agapornis pullaria*	2	15.4
6.	Grey wood pigeon	*Columba unicincta*	1	7.6
	Total		13	