BREEDING POTENCY AND HISTORY OF SELECTED ANIMAL SPECIES IN JOS WILDLIFE PARK

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ABSTRACT

Anthropogenic activities have decimating implications on wildlife population in the ecosystem. Breeding of wild animals in captivity was introduced as a way to safe species from extinction but this has posed some challenges. The study surveyed the breeding potency, trend, history and infant mortality of selected animal species in Jos Wildlife Park. Data for the study were obtained through oral interviews, observations, review of records and structured questionnaires. 24 respondents were randomly sampled. Data obtained were analysed using descriptive statistics in form of tables, percentages and frequency of counts. Results revealed that lion, Panthera leo (Linnaeus, 1758); leopard, Panthera pardus(Linnaeus, 1758); pigmy hippopotamus, Choeropsis liberiensis (Morton, 1849); derby eland, Taurotragus derbianus (Gray, 1847); stripped hyaena, Hyaena hyaena(Linnaeus, 1758); Grimms duiker (Sylvicapra grimmia:Linnaeus, 1758); Red-flanked duiker, Cephalophus rufilatus (Gray, 1846); and Maxwell's duiker Cephalophus maxwelli (Smith, 1827); and Kob Kobus kob (Erxleben, 1777); Waterbuck, Kobus ellipsiprymnus (Ogilby, 1833); and Red-fronted; gazelle, Gazella rufifrons (Gray, 1846) procured from different places have produced 17; 10; 8; 13; 24; 1; 6; 2; and 4 number of individuals respectively since inception of the park. The breeding of carnivores was between the years 1979 and 1993 with three infant mortalities. The pigmy hippopotamus, Choeropsis liberiensis bred between the years 1980 to 1992 with one infant mortality. The herbivores have been breeding almost on yearly basis with no infant mortality. Two leopards procured from the University of Ibadan did not breed. The only infant mortality recorded by the leopard was due to cannibalism. Jos Wildlife Park has been breeding, nurturing and distributing endangered, threatened, rare and abundant species of wildlife to several conservation centres in Nigeria suggestions to improve breeding of animal species were made.

Keywords: Breeding trend, Jos Wildlife Park, Animal species

INTRODUCTION

Wildlife could be seen as the totality of undomesticated life. Nevertheless the mammals, birds and reptiles are always given utmost consideration because of their relative abundance. The anthropogenic impact on the ecosystem has several implications on the wild animals due to its decimating effect on their population. However, many species become endangered, threatened and rare on earth while some even become

extinct, whereas there is a definite relationship between every organism and its environment. In essence, each species has a role it plays in the ecosystem.

Consequently, breeding of wild animals in captivity was introduced as an alternative means of protecting species from extinction for posterity. Breeding in captivity has also posed some challenges as wild animals can only breed where there is favourable environmental condition as in the natural habitat. This enables them to- feed well (Akum 1995) be psychologically relaxed, and play with mates (for those that are gregarious). Besides, good management and basic hygiene are also very relevant (Gwenlilian 1957, Bailey 1982, Ayodele 1988, Anderson 1991, Alarape 1995, Ayodele *et al.* 1999).

Apart from the simulated environment, breeding and survival rate are also affected by the potency or vigour of the individual animal species, where and how they were procured and the priority of management. Therefore, this work surveys the breeding trend, history and infant mortality of selected animal species in Jos wildlife park.

MATERIALS AND METHOD

The study area, Jos Wildlife Park is located 4 kilometers East of Jos, along Jos – Miango road, off Yakubu Gowon way, Jos, Plateau state. It is located on latitude $9^0 52^1$N and on Longitude $8^0 53^1$E. The Jos wildlife park covers an area of eight square kilometers enclosing hills, streams and varied upland vegetation, with about 43 kilometers network of Safari track. The state has an estimated population of 3 million people and is bounded by Kaduna, Bauchi, Taraba and Nasarawa states. The mean annual temperature of the state varies between 22^0C in the Jos Plateau in the North and 27^0C in the south of the state (FORMECU 1998).

Data pertaining to breeding, animal procurement and infant mortality were collected through oral interviews, observations, review of records and files, and structured questionnaire. The workers of Jos Wildlife Park were the target organs. The data obtained were analysed using descriptive statistics.

RESULTS

Demographic and social characteristics of respondents

Information on the socio-economic characteristics of respondents were analysed with regard to gender, occupation, marital status and educational qualification. Table 1 below indicates that all the respondents are Nigerians of Plateau State origin. Most of the respondents (79.8%) are males. The percentages of respondents who fell between the age ranges 40-49 years, 20-29 years and 30-39 years are 41.7%, 37.5% and 20.8% respectively. Majority of the respondents (45.8%) holds Ordinary National diploma (OND) or National Certificate of Education (NCE). Furthermore, most of the respondents (72.5%) have experience of more than 5 years in wildlife management. Most of them are full time staff and 62.5% are married.

Table 1: Demographic and social statistics of the staff respondents

Parameters	*Variables*	*Frequency distribution*	*Percentage*
Nationality	Nigerians		
	Non Nigerians	24	100.0
	Total	0	0.0
		24	100.0
State of origin	Plateau State	24	100.0
	Other states	0	0.0
	Total	24	100.0
Age group in Years	Less than 15	0	0.0
	16-19	0	0.0
	20-29	9	37.5
	30-39	5	20.8
	40-49	10	41.7
	Above 50	0	0.0
	Total	24	100.0
Marital status	Single	9	37.5
	Married	15	62.5
	Widowed	0	0.0
	Divorced	0	0.0
	Total	24	100.0
Education level	Illiterate	0	0.0
	Primary	6	25.0
	Secondary	2	8.4
	OND/NCE	11	45.8
	HND/University	5	20.8
	Total	24	100.0
Nature of work	Full time	23	95.8
	part time	1	4.2
	Total	24	100.0
Gender	Male	19	79.8
	Female	5	20.8
	Total	24	100.0
Years of service	Less than 5	9	37.5
	6-10	3	12.5
	11-15	4	16.7
	16-20	1	4.1
	21-25	3	12.5
	26-30	4	16.7
	Total	24	100.0

Breeding assessment of animal species

As presented in table 2, below all the respondents stated that many animal species have been breeding in Jos Wildlife Park (JWLP). All the respondents indicated that the lion, leopard, pygmy hippopotamus, and derby eland have reproduced while the elephant

and crocodile have never bred; (91.6%) of them indicated that red river hog has produced offsprings in Jos Wildlife Park. However, only derby eland and the lion have bred since the year 2000. All the respondents indicated that breeding in the park has reduced but would want it to continue in the park as it was in the 1980's. The respondents gave various reasons why breeding is reducing. The modal factor according to all the respondents is lack of funding; 83.3% of respondents noted inadequate number of cages/enclosures while 62.5% of the respondents complain of inadequate number of animal species.

Breeding among animal species

Table 3 presents the numerical information on the animal species that have bred in the park. This includes Lion (17 cubs), derby eland (13 calves), leopard (10 kitten), and pygmy hippopotamus (8 calves). The carnivores bred between the year 1979 and 1993. With exception of the derby eland that bred between 1980 and 2002 no other big game bred between the year 1992 and 2003. Table 3 also shows that the JWLP has distributed endangered species of animal to many zoos in Nigeria including Kano zoo, Makurdi zoo, Maiduguri zoo, Calabar zoo, Port Harcourt zoo, Jos zoo. University of Ilorin zoo, University of Ibadan zoo and Nekede (Owerri) zoo.

Breeding trend and infant mortality

Table 4 shows that the lions produced a total of 17 cubs with two mortality recorded. This table also depicts that out of the ten kitten by the leopard, only one mortality was recorded. Table 4 also reveals that out of 8 live births by the pygmy hippopotamus only one death was recorded in the year 1980. 13 births have been recorded by the derby eland species and all the calves survived. The eland also produced two different litters in the years 1981; 1985 and 2002. A total of 5 live births without any death have been recorded for duiker species. Table 5 also shows that all the 4 births by the kob species in Jos Wildlife Park between the year 1990 and 2002 survived.

DISCUSSION

The study shows that quite a large number of species bred successfully in the park. Some endangered species, lion and leopard bred and increased so tremendously in number that there was no place to keep them to the extent that the Jos wildlife park management JWLP started culling them. This is inconformity with the report of Laws et al. (1970). Derby eland has been breeding almost annually with all the calves surviving. This may be attributed to the fact that the initial male and female elands were procured from different locations (Maiduguri and Kano) which has helped in checking the problems of in-breeding. Moreover, the management supplies adequate forage throughout the year.

Table 2: Staff assessment of animal breeding in JWLP

Parameters	*Variable*	*Frequency distribution*	*Percentage*
Have animals been breeding in JWLP	Yes	24	100.0
	No	0	0.0
	Total	24	100.0
Which animals bred	Lion	24	100.0
	Elephant	0	0.0
	Leopard	24	100.0
	P. Hippopotamus	24	100.0
	Derby eland	24	100.0
	Crocodile	0	0.0
	Red river hog	22	91.6
Since 2000 which of these animals have bred	Lion	24	100.0
	Elephant	0	0.0
	Leopard	0	0.0
	Derby eland	24	100.0
	P. Hippopotamus	0	0.0
	Crocodile	0	0.0
	Red river hog	0	0.0
Is breeding reducing	Yes	24	100.0
	No	0	0.0
	Total	24	100.0
If yes why	No fund	24	100.0
	No cage/enclosure	20	83.3
	Insufficient animals	15	62.5
	Do not know	9	37.5
Do you want breeding to continue like before	Yes	24	100.0
	No	0	0.0
	Total	24	100.0

Table 3: History of breeding among the animal species in Jos wildlife park

Species	*place of Acquisition*	*No of births*	*Duration*	*Present Location of the Youngs*
Lion	Jos zoo	About 17	1979 -1993	Kano, Makurdi, Maiduguri, Enugu, Port-Harcourt and Calabar zoos
Leopard	Kano zoo	10	1979 - 1986	Unilorin, Jos, Port- Harcourt, Makurdi and Enugu zoos
Pygmy hippo	Liberia	8	1980 -1992	Maiduguri, Kano, Jos and Port- Harcourt zoos
Derby Eland	Maiduguri & Kano zoos	13	1980 - 2002	A male and female sent to Ibadan zoo Others intact
Gazzelle Species	Maiduguri zoo	2	1983 -1993	Intact
Kob Species	----------	4	1990-2002	Intact
Duiker	Port-Harcourt, Ibadan zoo	24	1980-2001	one sent to Owerri others intact
Stripped hyaena	Jos Zoo	1	--------	--------

Source: Ijeomah, 2003

Pigmy hippopotamus has recorded only one death due to accident. The Pygmy hippopotamus could not breed at Maiduguri but has really bred in the JWLP "hippo pool" this could be attributed to the park environment. Other species that have bred include: stripped hyaena (hyaena hyaena: Linnaeus, 1758), Kob (kobus kob: Erxleben 1777), Water buck (Kobus ellipsiprymnus:Ogilby 1833), Red river hog (Potamochoerus porcus: Linnaeus 1778), Red Flanked duiker (Cephalophus rufilatus: Gray 1846), Grimms duiker (Sylvicapra grimmia:Linnaeus 1758), Maxwell's duiker(Cephalophus maxwelli:Smith,1827) Red – fronted Gazelle (Gazella rufifrons:Gray 1846).

Species that have not bred in the park include the African elephant, Loxodonta africana(Blumenbachi 1797); Royal python, Python sabae; Nile crocodile, Crocodylus niloticus; African buffalo, Syncerus caffer (Sprrman 1779); monitor lizard, Veranus niloticus and Martial eagle Polemaetus bellicocus. The Ostriches, Struthio camelus have laid many eggs, the eggs were taken to the National Veterinary Research Institute (NVRI) Vom in April 2004 but none hatched.

Table 4: Breeding trend and infant mortality of some selected wildlife species in JWLP

Animal species	*Date of parturition*	*Size of litter*	*No survived*	*Cause of mortality*
Lion	13/2/79	3	2	Accidental breaking of limb
	03/1/79	4	3	Killed by Leopard
	16/1/83	3	3	-
	1/6/85	3	3	-
	24/5/92	2	2	-
	4/1/92	2	2	-
	Total	17	15	
Leopard	5/11/82	3	3	-
	11/12/82	3	3	-
	30/3/83	2	2	-
	30/3/86	2	1	Carnibalised by the mother leopard
	Total (Carnivores)	10	9	
Pigmy hippopotamus	4/5/80	1		1
	14/9/80	1		0
	1/1/82	1		1
	12/11/83	1		1
	4/9/85	1		1
	5/6/87	1		1
	4/5/92	1		1
	26/5/92	1		1
	Total	8		7
Derby eland	8/2/80	1		1
	5/2/81	1		1
	2/8/81	1		1
	3/5/82	1		1
	12/4/83	1		1
	16/1/85	1		1
	16/12/85	1		1
	6/1/86	1		1
	4/2/91	1		1
	10/7/93	1		1
	29/4/2000	1		1
	16/2/02	1		1
	6/7/02	1		1
	Total	13		13
Duiker species	8/12/80	1		1
	31/8/81	1		1
	21/4/82	1		1
	30/12/93	1		1
	14/2/94	1		1
	Total	5		5
Kob species	18/4/90	1		1
	14/3/91	1		1
	10/1/2000	1		1
	13/4/02	1		1
	Total (Herbivores)	4		4

The survey reveals a great reduction in the breeding of carnivores, which increased from the inception of the park to 1986 and finally stopped in 1993. This could be due to inadequate facilities, poor funding and neglects of the then government of Plateau State. Also since 1992, the Pygmy hippopotamus has not bred due to the death of the female hippotamus 'kwakwaya'. And attempts by the JWLP management to procure another female from Maiduguri failed. Two deaths recorded by the cubs were accidental while a leopard that grasped the cub through the wire killed one of the cubs. Another cub broke its limb as it slips in between two woods kept for branchiation in the enclosure. The only kit recorded dead for the leopard was killed and eaten by the 'mother' leopard despite available meat to feed on in the cage. This is an act of carnibalism, a natural way of population reduction in the wild.

High success in breeding generally recorded is caused by the favourable environmental condition of Jos couple with the cool environment, which encourage animals to mate. The antelopes, gray duicker, kob (tobi) had enough food with decimating factors checked so they could not be attacked by any predator as noted by Leopold (1933) on predator control. The leopard procured from the University of Ibadan on the 17th of December 1991 did not breed until it died. Also in 1989 a male leopard was brought to JWLP from the university of Ibadan zoo through animal transfer programme. This leopard stayed with the female born in the park yet they did not breed. Nevertheless it cannot be conclusively said that their inability to breed was caused by the location of procurement.

It seem to be the period when the management have changed their priority and diverted from concentration on the breeding of carnivores due to cost of feeding them as they are flesh eaters. The reason which might have prompted the culling of some of the animals to minimize cost in conformity with Laws *et al.* (1970); Ayodele (1988) For instance on the 16th of March, 1980 when lions attacked and killed the animal keeper, Mr. Isha Jarawa, all the five lions came out of the enclosure and the police was invited to shoot all of them. In essence all the lions then were culled and replaced. Jos Wildlife Park has supplied lions, leopards and pygmy hippopotami to many parks and zoos in Nigeria.

Elephants have not bred in JWLP. Moreso, elephant have never bred any where in Africa under captivity except in South Africa. An IUCN recognized breeder, A. S Peter (personal communication), who had participated in breeding elephants under captivity in Britain attributed the failure to breed in captivity to inadequate space, feeding, age differential and male and female ratio. The primates and birds managed under extensive system breed profusely in the park as in the Yankari National Park. Most of the species that have not bred may be attributed to their being either kept alone or single sex. Crocodile if paired in JWLP with opposite sex, may breed. However, it may likely hatch more female crocodiles because of the low temperature always experienced in the Jos Plateau ecological zone. Since temperature affects the gender of reptiles especially crocodiles and tortoises during breeding (Ijeomah 2003). Wildlife explorer (1996) gave a similar report that if crocodile eggs are incubated at a temperature below 29°C all the youngs will be female.

CONCLUSIONS AND RECOMMENDATION

Jos Wildlife Park was formerly a place where endangered, abundant and rare wildlife species were bred, nurtured and distributed to parks and zoos in Nigeria. Suddenly, as a result of military intervention with their attendant policies and politics, neglects set in and breeding seriously declined. Many dead wildlife species especially the big games can hardly be replaced. Presently, JWLP is lacking: male pygmy hippopotamus, male red river hog, leopard, water buck, zebra, rhinoceros, giraffe, hyaena, warthog, male buffalo, and porcupine.

Moreover, the park cannot procure these animals through other parks and zoos in Nigeria even from Maiduguri zoo, which has only a male pygmy hippopotamus and record shows that the species had never bred there. Nevertheless, the antelopes have been breeding on annual basis with no mortality recorded over the years. Thus the park should domesticate the antelopes especially derby eland because of its adaptability, meat value, breeding potency and high infant survival rate. Besides, breeding programmes should be encouraged with excess offsprings returned to the wild, sold or donated to the zoos and parks.

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