

Survey of mammalian wildlife species in the Stubbs Creek Reserve, Akwa Ibom State Nigeria.

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ABSTRACT

An ecological survey of the mammalian wildlife species was carried out in the Stubbs Creek Forest Reserve, Akwa Ibom State. Stubbs Creek Forest is part of the Cross-Niger Transition Forest eco-region as defined by the World Wide Fund for Nature (WWF). The conservation status of the region is rated as critical/endangered. The Stubbs Creek forest harbors several rare or threatened species particularly the sclater's or Nigerian guenon (*Cercopithecus sclateri*) which is endemic in Southern Nigeria, and the African grey parrot (*Psittacus erithacus*). It is feared that intense human activities and pressure over the years in the area may be causing increased degradation and fragmentation of the forest and a consequent reduction and/or extinction of its large wildlife population. This study was carried out to ascertain the current status of the mammalian wildlife species and consequently raise levels of conservation awareness in the area. The survey involved observatory sampling technique including indirect observation and participatory Rural Appraisal involving market surveys, interviews and use of formatted questionnaires. The study revealed that mammalian wildlife such as sclater's guenon, putty-nosed monkey, grasscutter, porcupine, ground squirrel, bush pig, fruits bat, ottershrew, sitatunga, civet, blue duicker, pottos and rabbit are still present while elephant, gorilla and lion might be extinct. Logging, farming, hunting, and oil and gas exploration activities are some potential threats to the reserve. The need to evolve unified and effective strategies and policies for the conservation and management of threatened species and the Stubbs Creek ecosystem is discussed.

INTRODUCTION

Nigeria's 445 forest reserves occupy a total land area of 9,651.8Km². Most of the forest and game reserves have not been gazetted since inception. A few of the gazetted ones are in a state of mismanagement due to increasing pressures on the natural resource base. Biodiversity is often used as a measure of the health or productivity of biological systems. The biological diversity of the earth encompass species of plants, animals, microorganisms and their gene pools and distributed in the different ecosystems on the planet (deserts, rainforest and coral reefs etc.). The conservation of biological diversity has become an issue of global concern. Nigeria is a signatory to the International Convention on Biological Diversity (Rio Earth Summit, 1992). The convention emphasizes the need for the preservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of benefits arising out of the utilization of genetic resources including access to genetic resources and appropriate transfer of relevant technologies, taking into account all rights over those resources and technologies.

The term wildlife will be used in this paper in its generally accepted but restricted sense to refer to the vertebrates (animals with backbone). Wildlife heritage in Nigeria is of great importance for a number of reasons. Firstly, wildlife is said to supply 20% of the annual consumption of animal protein in the rural areas of the forest belt. The figure is put at 13% for the country as a whole. Popularly known as bush meat, wildlife meat is regarded as a delicacy in the urban areas where it commands high prices.

Also, wildlife provides an avenue for recreation. People derive a lot of pleasure from viewing animals in their natural environment. For example, many Nigerians visit Yankari Games Reserve in Bauchi State and the Obudu Cattle Ranch in Cross River State. Schools organize excursions to wildlife parks to enable students see at first hand some of the biological phenomena which cannot be demonstrated in conventional school laboratory and this enhances their understanding.

Stubbs Creek Forest is the only remaining natural coastal swamp forest of any significant size in Akwa Ibom State (Tooze *et al.*, 1998; Tooze *et al.*, 1998b). It is the largest and only gazetted forest reserve in Akwa Ibom State. The only chance for the survival of representative habitat and species assemblages of the Cross-Niger transition Forest ecoregion lies in the continued protection and expansion of the Stubbs Creek Forest Reserve and in efforts to sensitize, educate, mobilize and integrate the ultimate aim of conserving the Reserve.

Past surveys (e.g. Tooze 1998a) in the forest reserve have listed available mammalian wildlife to include: grasscutter (*Thrynomys swinderianus* I), bush pig (*Potamochoerus porcus*), bush buck (*Tragelaphus scriptus*), grey duiker (*Sylvicapra grimmia*), tree hyrax (*Dendohyrax arborea*), tree squirrel (*Funisciurus pyrropus*), civet cat (*Viverra civetta*), mono monkey (*Cercopithecus sclateri*) sclater guenon (*Cercopithecus sclateri*), red-capped mangrove (*Cercocebus torquatus*) and mongoose (*Mungos mungo*).

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There were also reports of the presence of elephant (*Loxodonta Africana*), hippopotamus (*Hippotamus amphibious*), sitatunga (*Tragelaphus spekki*) and Leopard (*Acinonyx jubatus*). In 2003, CERCOPAN, a Nigerian conservation NGO based in Calabar, Cross River State carried out a survey of the Stubbs Creek Forest Reserve, with emphasis on current threats (such as use of forest resources and related pressure) to the forest reserve, updating basic socio-economic information and assessing current status of diurnal primates. Among others, the 2003 survey reported the presence of some diurnal primates in the Stubbs Creek Forest Reserve including Sclater's guenon (*Cercopithecus sclateri*), Mona guenon (*Cercopithecus mona*), putty-nose guenon (*Cercopithecus nictitans*), Red-capped mangabey (*Cercocebus torquatus*) and Golden potto (*Arctocebus calabarensis*).

The Chimpanzee (*Pan troglodytes*) though considered extinct earlier was reported present but "very rarely" seen by the local people. The Stubbs Creek Forest Reserve is presently under tremendous pressure from increased human activities like oil exploration and exploitation by Exxon Mobil Nigeria, farming at the west end, hunting and timber logging and more recently oil and gas exploitation (by Centrica Resources limited and Universal Energy Limited) at the east end of the reserve.

Pollution of the environment from these activities, might pose serious threat to the health and wellbeing of human and wildlife populations. This work aims at evaluating the current status of mammalian wildlife species in the Stubbs Creek forest reserve area. The study is important as it will:

- a. Raise awareness on the biological significance as well as available biodiversity, tourism, and conservation potential of the Stubbs Creek Forest Reserve.
- b. Identify some environmental threats to wildlife survival/distribution in the reserve.
- c. Provide a fresh stimulus for sustainable exploitation of the rich natural resources of the area.
- d. Promote the development of effective strategies and policies for the conservation and management of threatened species and the Stubbs Creek Forest reserve.

MATERIALS AND METHODS

Location of study area

Stubbs Creek Forest Reserve is bordered by the Atlantic Ocean on the south, the Qua Iboe River on the west, and the Cross River on the east. In the southwest of the Reserve, at the beachline, is the Exxon

Mobil – Nigeria's Qua Iboe Terminal (QIT) (4°32'3N, 8°00'56E). Exxon Mobil's operations and associated activities represent the major industry in the Ibeno region. The communities in and around Stubbs Creek belong to one of three Local Government areas (LGAs), Esit Eket, Mbo and Ibeno.

Stubbs Creek Reserve is predominantly a fresh water swamp forest that seasonally floods in some zones; it also comprises brackish-water, mangrove forest in the Eastern end of the Reserve, secondary forest, farmland, palm brush and abandoned farms (Gadsby, 1989). The two major creeks, Stubbs and Widenham run West-East (at about 4°36'N) in the Northern half of the reserve. Stubbs Creek flows west from the reserve centre into Quo Iboe River, while Widenham flows east from the reserve centre into the Cross River on the eastern border. These water ways are tidal and provide access into the reserve (Gadsby, 1989). Mean annual rainfall for the coastal region is high, from 2,000mm to 2,500mm (Were, 2001).

Survey procedure

The survey was carried out in communities in and around the Stubbs Creek forest reserve including Ukpenekang, Mkpanak (in Ibeno LGA), Akpanusung, Ntak Inyang, Odoro Nkit, (in Esit Eket LGA), Unyenge and Enwang in Mbo Local Government Areas.

In consonance with international standards of ethical and legal practice, local communities around the study area were consulted, taking into account the beliefs, customs and rights of local communities. Research permits and identification letters were obtained from Akwa Ibom State Ministry of Environment and the Department of Zoology and Environmental Biology, University of Calabar, Calabar.

The survey methods involved:

1. Reconnaissance (survey walks)
2. Observatory sampling techniques including indirect observation and picking of samples of specimens
3. Participatory Rural Appraisal involving market surveys, interviews and use of formatted questionnaires.

Reconnaissance (survey walks)

A "quick and dirty" first assessment (reconnaissance survey) was carried out through local communities in and around the Stubbs Creek forest. This was done from Ukpenekang Communities to the beach and Qua Iboe Terminals (QIT), Mkpanak in Ibeno LGA; Ntak Inyang and Odoro Nkit Communities in Esit Eket LGA as well as Enwang and Unyenge Communities in Mbo LGA (Fig.1). The reconnaissance survey was intended to facilitate the determination of appropriate methods and materials required to gather detailed information. Images of animals observed during the study were recorded using Mecury Cyberpix S-500V digital camera.

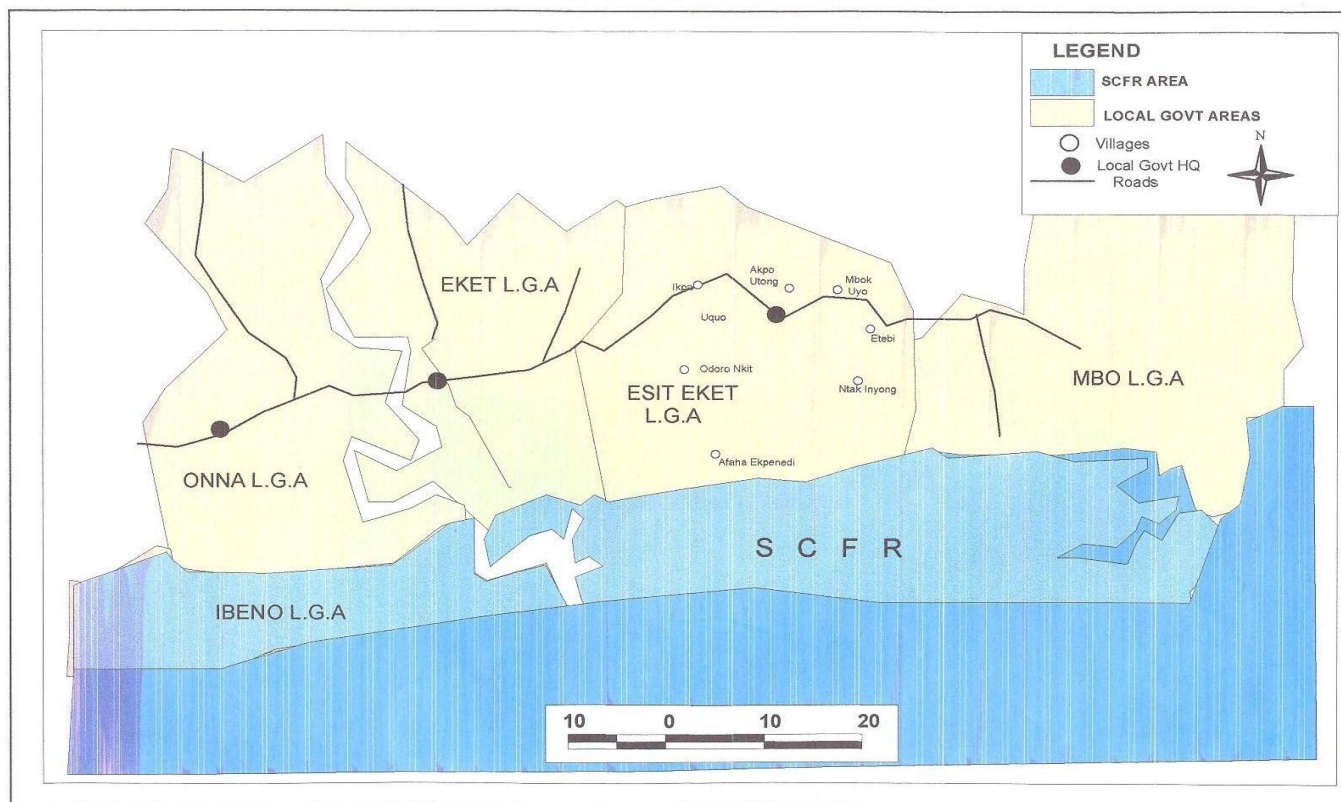


Fig 1: Map showing the location of the Stubbs Creek Forest reserve and surrounding communities.

Observatory sampling techniques

This method involves scouting for evidence of the presence of wildlife species through indirect signs like footprints, droppings, tracks, listening to the noise (sound) of different animals and the type of vegetation that they could be easily identified with. For small mammals such as bats, dusk-time walk near forest streams and fruiting/flowering trees produced an indication of their numbers. For rodents, searching under fallen logs for footprints as well as discarded food remains or faecal pellets was done. All the surveys were carried out in the rainy and dry seasons (June – July and October – November, respectively).

Participatory rural appraisal

Major local markets around the study area (Ibeno market in Ibeno LGA, Ikpa market in Esit Eket LGA and Enwang market in Mbo LGA) were visited to obtain information from the market men and women on the types of animals available in the study area. Also, formatted questionnaires were administered in villages and settlements in and around the Stubbs Creek Reserve. Targeted villages were those with the greatest access to the forest (Akpanlung, Ntak Inyang and Odoro Nkit in Esit Eket LGA; Ukpenekeang and Mkpanak in Ibeno LGA and Unyenge and Enwang in Mbo LGA).

The targeted respondents including native, non-natives/settlers and visitors were farmers, hunters, village heads, youth leaders, fuel wood collectors, carpenters, timber dealers, fishermen, mat makers, palm wine tappers, contractors.

The questionnaires were structured to provide information on attitude, perception and behavioural practices towards mammalian wildlife species in the study area. Particularly, hunters were asked to provide detailed information on wildlife as they can more accurately describe the fauna in the forest where they hunt. The ultimate aim of the interview was to determine presence/absence of major mammals in a particular area, gather a general idea of species status (for example, common or rare) and determine the degree of hunting pressure.

Identification and classification of sample

Animals were identified and classified to species level using the Field Guide and Keys of Kingdom (2004). Criteria like tail and skin colour were used as aids in identification.

RESULTS

During the Reconnaissance and observatory sampling survey, some mammalian wildlife species were observed and recorded (e.g. *Cercopithecus sclateri*) (Fig.2).



Fig. 2. Picture of freshly killed sclater's guenon (*Cercopithecus sclateri*), seen with a local hunter at Ntak Inyang, Esit Eset LGA.

The prominent primates found in the area include Putty-nosed monkey (*Cercopithecus nitatans*), Sclater's guenon (*Cercopithecus sclateri*), Spider monkeys (*Ateles sp*), Pottos (*Perodictus potto*). Commonly found Rodents are the ground squirrel (*Xerus erythropus*), Palm squirrel (*Sciurus sp*), Black rat (*Rattus rattus*), Porcupine (*Hystrix cristata*) and mainly the Grasscutter (*Thrynomys swinderianus*). Few species of the class Carnivora, Antiodactyla, Insectivora and Chiroptera were equally found (Table 1).

Some Respondents were shown photographs of some mammalian wildlife species in the study area to ascertain knowledge of abundance, distribution and seasonal availability of specific wildlife in the area. Table 2 shows the distribution and relative abundance of wildlife species in the study area. The commonest species of mammalian wildlife in the study area are fruit bat (10.2%), ground squirrel (9.57%), grasscutter (9.11%), porcupine (9.11%), bush pig (8.43%), sclater's guenon (7.97%).

Table 1. Some mammalian wildlife species recorded in the study area

Order/Class	Common Name	Scientific Name	Conservation Status**
Primates	Putty-nosed monkey	<i>Cercopithecus nitatans</i>	Threatened
	Sclater's guenon	<i>Cercopithecus sclateri</i>	Threatened
	Spider monkey	<i>Ateles sp</i>	Rare
	Pottos	<i>Perodictus potto</i>	Rare
Rodentia	Ground squirrel	<i>Xerus erythropus</i>	Common
	Palm squirrel	<i>Sciurus sp</i>	Common
	Black rat	<i>Rattus rattus</i>	Common
	Porcupine	<i>Hystrix cristata</i>	Common
	Grasscutter	<i>Thrynomys swinderianus</i>	Common
Carnivora	Leopard	<i>Panther pardus</i>	Rare
	Civet (bush dog)	<i>Civetticus civetta</i>	Common
Antiodactyla	Pigs	<i>Sus scrofa</i>	Rare
	Red River Hog	<i>Potamochoerus porcus</i>	Rare
	Antelope	<i>Panther pardus</i>	Rare
	Grey duicker	<i>Cephalophus monticola</i>	Rare
	Sitatunga	<i>Tragelaphus spekei</i>	Rare
Insectivora	Otter shrew	<i>Potamogale velox</i>	Rare
	Hedge hog	<i>Erinaceus albiventris</i>	Rare
	Moles	<i>Talpa sp</i>	Rare
Chiroptera	Fruit bat	<i>Pteropus sp</i>	Common

**Conservation status based on NARESCON.

Table 2. Wildlife distribution and relative abundance in the Stubbs Creek Forest Reserve

	Common Name	Taxon	Abundance				Distribution				Seasonal Availability	
			Common		Scarce		Localized		Widespread		Both Seasons	
			F.	%	F.	%	F.	%	F.	%	F.	%
1.	Sclater's Guenon	<i>Cercopithecus sclateri</i>	35	7.97	-	-	1	4.76	35	8.05	36	7.91
2.	Putty-nosed monkey	<i>Cercopithecus nititans</i>	31	6.61	-	-	-	4.76	-	6.44	-	-
3.	Other species of monkey		17	3.87	-	-	-	-	17	3.91	17	3.74
4.	Grasscutter	<i>Thryononsyms swinderianus</i>	40	9.11	-	-	-	-	40	9.20	40	8.79
5.	Porcupine	<i>Hystrix cristata</i>	40	9.11	1	-	1	4.76	40	9.20	40	8.79
6.	Ground Squirrel	<i>Xerus erythropus</i>	42	9.57	-	-	-	-	42	9.66	42	9.23
7.	Bush pig (Wild boar)	<i>Sus scrofa</i>	-	-	2	11.76	4	19.05	35	8.05	39	8.57
8.	Fruit bat (Flying fox)	<i>Pteropus species</i>	44	10.02	-	-	1	4.76	43	9.89	44	9.67
9.	Civet	<i>Civetticus civetta</i>	31	6.61	-	-	-	-	-	6.67	-	-
10.	Leopards	<i>Panther pardus</i>	-	-	-	11.76	-	14.29	-	5.52	-	-
11.	Antelope	<i>Panther pardus</i>	14	3.19	-	-	-	-	-	3.22	-	-
12.	Ottershrew	<i>Potamogale velox</i>	-	-	13	5.88	-	4.76	-	2.99	-	-
13.	Hedge hog	<i>Erinaceus albiventris</i>	-	-	9	5.88	-	-	-	-	-	-
14.	Pottos	<i>Perodictus potto</i>	-	-	8	17.63	-	-	-	-	-	-
15.	Sitatunga	<i>Tragelaphus spekei</i>	-	-	2	29.41	-	23.81	-	1.46	-	-
16.	Rabbits		-	-	-	5.88	-	-	-	0.23	-	-
17.	Blue duicker		-	-	29	5.88	-	4.76	-	6.21	-	-

Source: Field Survey Data (2008) Note: A dash (-) means no response. F = Frequency

The data in Table 2 also reveals that the relative abundance (%) of the following species are rare and highly threatened. These may become extinct except prompt and adequate management strategy is put in place. The species include: sitatunga (29.41%), pottos (17.63%), leopard (11.76%), bush pig (11.76%), sclater's guenon (5.88%), porcupine (5.88%), otter shrew (5.88%), blue duicker (5.88%), and hedge hog (5.88%). On seasonal availability, all the mammals occurring in the Stubbs Creek forest were found to occur in both rainy and dry seasons.

Respondents' perception of animals that were once present and when they were last seen in the study area are presented in the Table 3.

In the opinion of 64.71% of the respondents, elephants were last seen in the area in 1985 with the highest number of recent sightings between 1966 and 1975 and the lowest between 1976 and 1985. A few of the respondents are of the opinion that bush pig and antelope are still present in the area with very recent sightings in 2005 till date. Gorilla, lion and sitatunga were last seen by a few respondents in 2000. Gorilla in particular were said to have occurred between 1966–1975, 1986–1995, 1996–2000 with the highest frequency recorded between 1986 – 1995 and the lowest between 1996 and 2000.

Table 3. Respondents' perception of animals that were once present and when they were last seen in the study area.

S/N	Common Name	1966-1975		1976-1985		1986-1995		1996-2000		2001-2005		2005 -		Total	Average
		Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%		
1.	Elephant	14	87.5	8	100	-	-	-	-	-	-	-	-	22	64.71
2.	Bush Pig	-	-	-	-	-	-	-	-	-	-	1	50	1	2.94
3.	Antelope	-	-	-	-	-	-	-	-	-	-	-	-	1	8.82
4.	Lion	-	-	-	-	2	40	1	33.3	-	-	-	-	3	5
5.	Gorilla	2	12.5	-	-	3	60	1	33.3	-	-	-	-	6	17.65
6.	Sitatunga	-	-	-	-	-	-	1	33.3	-	-	-	-	1	2.94
	TOTAL	16	100	8	100	5	100	3	100	-	-	2	100	34	100

Source: Field Survey Data (2008) **Note:** A dash (-) means no response.

Hunting was identified by most of the respondents as being prevalent in the Stubbs Creek forest when compared to other smaller forests around the area (Table 4).

Table 4. Respondents' perception of the prevalence of hunting activities in forests within the study area.

Location	Frequency	Percentage (%)
Stubbs Creek	13	100.00
Other Forests	-	-
Total	13	100.00

Source: Field Survey Data (2008). **Note:** A dash (-) means no response.

An estimation of the monthly income from hunting activities in the study area according to the Respondents is shown in Table 5. Monthly income derived from hunting activity through sale of bush meat ranged between ₦1, 000 (lowest) and ₦60, 000 (highest).

Table 5. Potential monthly income from hunting activities in the area according to respondents.

Amount (₦)	Frequency	Percentage (%)
1,000	1	9.09
3,000	1	9.09
15,000	3	27.27
20,000	1	9.09
30,000	1	9.09
60,000	1	9.09
Not for sale	3	27.27
Total	11	100

Source: Field Survey Data (2008)

Table 6 records the responses of respondents with respect to the trend and frequency of wildlife catches in the previous five years in the area. Most respondents (69.24%) were of the opinion that the frequency of wildlife catches in the previous five years has been on the decrease in the area and its environs.

Table 6. Responses of Respondents based on nature of catch in the past five (5) years in the study area and its environs

Response	Frequency	Percentage (%)
Increasing	2	15.38
Decreasing	9	69.24
The same	2	15.38
Total	13	100.00

Source: Field Survey Data (2008)

Reasons adduced for decreasing trends in wildlife catches in the opinion of the Respondents are highlighted in Table 7. The reasons

include; increase in human population, wood/timber logging, road construction, migration, flooding, noise, deforestation, and other human activities particularly gas and oil exploration.

Table 7. Respondents' reasons for decreasing trends in wildlife catches over the past five years (2003 - 2008).**Source: Field Survey Data (2008)**

Increase in human population	5	26.32
Extinction of wildlife	1	5.26
Flooding	3	15.79
Migration	1	5.26
Noise	1	5.26
Deforestation	3	15.79
Wood logging/timber dealers	2	10.53
Human activities (Gas flaring and Oil Exploration)	2	10.53
Road construction	1	5.26
Total	19	100

DISCUSSION

Results show that the Stubbs Creek Forest Reserve has a high diversity of mammalian wildlife species. The mammalian wildlife species reported in the area include Sclater's guenon (*Cercopithecus sclateri*), Putty-nosed monkey (*Cercopithecus nictitan*), spider's monkey (*Ateles sp*), pottos (*Perodictus potto*), grasscutter (*Thrynomys swinderianus*), porcupine (*Hystrix cristata*), grey duicker (*Cephalophus monticola*), palm squirrel (*Sciurus sp*), ground squirrel (*Xerus erythropus*), and sitatunga (*Tragelaphus spekei*). The monkeys forage in small groups. The small blue duicker were found nibbling on abundant fruits dropped in the forest floor by the monkeys and birds. Ground squirrel (*Xerus erythropus*) are diurnal and live in high forest zone, roads and foot paths. Sitatunga (*Tragelaphus spekei*) were seen to inhabit shrubby growth bordering forest waterways. They feed on shrubs, herbs and grasses. They are mostly active from 18.00 – 06.00 hours. A rich supply of greenery permits exceptionally small home ranges and potentially high densities.

The presence of certain species of monkeys including sclater's guenon, putty-nosed monkey confirms the work of Gadsby and Jenkins (1989), Nigerian Conservation

Foundation NCF (2000) and CERCOPAN (2003). Gadsby and Jenkins (1989) reported that a good deal of forest survived in the reserve with four prominent species of monkey including red-capped mangabey (*Cercocercas torquatus*), mona guenon (*Cercopithecus sclateri*), putty-nosed guenon (*Cercopithecus nictitan*), and sclater's guenon (*Cercopithecus sclateri*).

The 2003 survey by CERCOPAN revealed the presence of sclater's guenon (*Cercopithecus sclateri*), mona guenon (*Cercopithecus sclateri*), red-capped mangabey (*Cercocercas torquatus*), and Golden Potto (*Arctocebus calabarensis*). Other mammals like elephants, antelopes, gorilla, lion which were formerly reported to be abundant have become threatened or extinct.

The drastic reduction of the population status of these wildlife species has been attributed to the wide range of human activities going on in the Stubbs Creek Forest Reserve especially with the creation of Akwa Ibom State and Local Government Areas in 1989. These include wood/timber logging, farming, hunting, deforestation, oil and gas exploration and exploitation.

Over 69% of the respondents to the questionnaire confirmed that there has been a drastic decrease in the trend and frequency of wildlife catches in the forest reserve over the previous five years. The respondents during the study listed the reasons for decreasing trend in wild life catches over the previous five years to include; increase in human population, flooding, migration, noise, deforestation and road construction.

CONCLUSION

The Stubbs Creek Forest Reserve is considered to be one of the last significant tracts of forest in the Cross Niger Transition Forest Eco region. It has been recognized for high species richness and high endemism in some taxa particularly in the primates. The reserve is currently subjected to intense human activities and pressure leading to

increasing degradation and fragmentation of the forest. Consequently, the hitherto large mammalian wildlife population is gradually being reduced to perilously low levels.

This study reveals that the forest reserve still inhabits some wildlife mammalian species particularly the sclater's guenon, *Cercopithecus sclateri* (which is equally endemic in the region). There is an urgent need to protect the remnant freshwater swamp and riparian forest from further destruction. The need to conserve representative samples of natural vegetation as units of biodiversity is presently an issue of global interest. According to Werre (2001), "The only chance for the survival of representative habitat and species assemblages of this eco-region lies in the continued protection and expansion of the Stubbs Creek Game Reserve." Deliberate effort must be made by government and non-governmental organizations to encourage the preservation of the reserve. The current Biodiversity Action Plan initiated for the Stubbs Creek Forest by Shell Development Production Company (SPDC) is a step in the right direction. A conservation programme should be evolved for a segment of the reserve to be declared a wildlife sanctuary. This will further boost the tourism potential of the area.

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