

## LARGE MAMMALIAN FAUNA OF IDANRE FOREST RESERVE, ONDO STATE, NIGERIA

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### Abstract

*Large mammalian species of Idanre Forest Reserve, Ondo State was assessed using the line transects method. Nine (9) large mammals were observed out of which three (3) were sighted directly, and six (6) were observed using indirect indices such as footprints, fecal droppings and animals activities. A total number of 148 large mammals were observed of which three (3) primate species; red-capped mangabey (*Cercocebus torquators*), mona monkey (*Cercopithecus mona*) and white-throated monkey (*Cercopithecus erythrogaster*) were sighted. Four species of antelopes; bushbuck (*Tragelaphus scriptus*), Maxwell duiker (*Cephalophus maxwelli*), yellow-backed duiker (*Cephalophus silvicultor*) and forest buffalo (*Syncerus caffer nanus*) were also observed. Others include bush pig (*Potamochoerus porcus*) and the African civet (*Civettictis civetta*). It was also revealed that *C. torquatus* has a different encounter rate 0.16sighting/km but the *C. mona* and *C. erythrogaster* have the same encounter rate of 0.4sighting/km respectively. The result also showed that the reserve support more population of Maxwell duikers with 28.57% frequency of occurrence and little population of yellow-backed duiker with 0.84% frequency of occurrence. There is a very strong correlation between the sightings in the morning and evening ( $r=0.86$ ,  $P<0.05$ ). There are still some significant quantities of large mammals in the reserve most especially the primates (the monkeys) which if allowed settle down within the remaining forested habitat and patches within the reserve can increase in terms of population size. Therefore, sustainable management of the reserve will lead to increase in species composition of large mammalian species within the reserve. It is therefore very important to intensify awareness campaign and protection effort of Idanre Forest Reserve.*

**Key Words:** *Large mammals, Fauna, Line transect, Idanre and Forest reserve*

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### Introduction

Large mammals are fundamental elements in many ecosystems. Mammals are warm blooded vertebrate animal of the class of mammalian. They are

distinguishing by the possession of fur or hair on their body and the secretion of milk by the females (Schipper *et al.*, 2007). Mammals distribution and abundance had faced increased predation,

possibly heat stress and competition for food from birds and human. Many of the tropical species of mammals are locally endemic and patchily distributed (Richards *et al.*, 1996). In fact the long term survival of large bodied vertebrates, such as top predators and large herbivores that may be intolerant of human persecution and habitat changes, will only be ensured if these reserves are effectively protected and well connected (Marsden *et al.*, 2005; Chetkiewicz *et al.*, 2006).

The major problem of wildlife conservation in Nigeria is habitat destruction due to human interference with the environment (Ogunjemite *et al.*, 2007). All these habitat alterations lead to climate change which has resulted into loss of soil nutrients which greatly reduces biological productivity (Agbelusi *et al.*, 1999). It was reported by Afolayan *et al.* (2004) that most of the original wildlife habitat in Nigeria had been lost. This has impacted the wildlife resources within Nigeria leaving only few populations of wildlife resources in protected areas.

Idanre Forest Reserve contains a sizeable amount of fauna species especially the large mammalian component. The forest reserve is one of the reserves that offer great opportunity for the actualization of the country's ecotourism potentials. Therefore the entire ecological community of Idanre Forest reserve is fundamental to the successful development of Idanre Hill; a proposed heritage site. The site has evolved with its ecological community which serve as recruitment source for the unique flora and fauna of the site. Thus any development that will not take into consideration the synergy between the

biotic components of the site and the geomorphologic features cannot be viewed as sustainable for the site. This study seeks to assess the species composition and the sighting rate of large mammals within the reserve.

## Materials and Method

### Study Area

Idanre forest reserve covers an area of 540.45km<sup>2</sup> and bordered by Akure-Ofosu Forest Reserve and Ala forest reserve (Ikemeh, 2013). The forest reserve is situated between latitude 6° 45' and 06° 58' 32"N and longitude 04° 59' 15"E and 05° 12' 4" in the lowland forest zone in Ondo state. The forest reserve receives a mean annual rainfall of 1654mm of rain annually (Ikemeh, 2013). The region experiences 3 months of dry season from December to February with intermittent rain showers in March.

The forests fall within the Nigerian lowland forest ecoregion where intact natural forest vegetation still persists, some relatively dominant plant species include *Cola spp.*, *Mansonia altissima*, *Nesogordonia papaverifera*, *Pterygota spp.*, *Sterculia spp.*, *Triplochiton scleroxylon*, *Antiaris africana*, *Ficus spp.*, *Milicia excelsa*, *Brachystegia spp.*, *Cylicodiscus gabunensis*, *Piptadeniastrum africanum* (Werre, 2001). The vegetation is mainly secondary forest with patches of primary forest at higher elevation in rugged terrain.

However, land cover and original forest vegetation has long been modified by various forms of human activities particularly logging and farming. An equally large area has become fallow dominated by the invasive weed *Chromolaena odorata* suggesting recent

clearing and in some cases the vegetation has regenerated gradually into secondary

regrowth (Ikemeh, 2013).

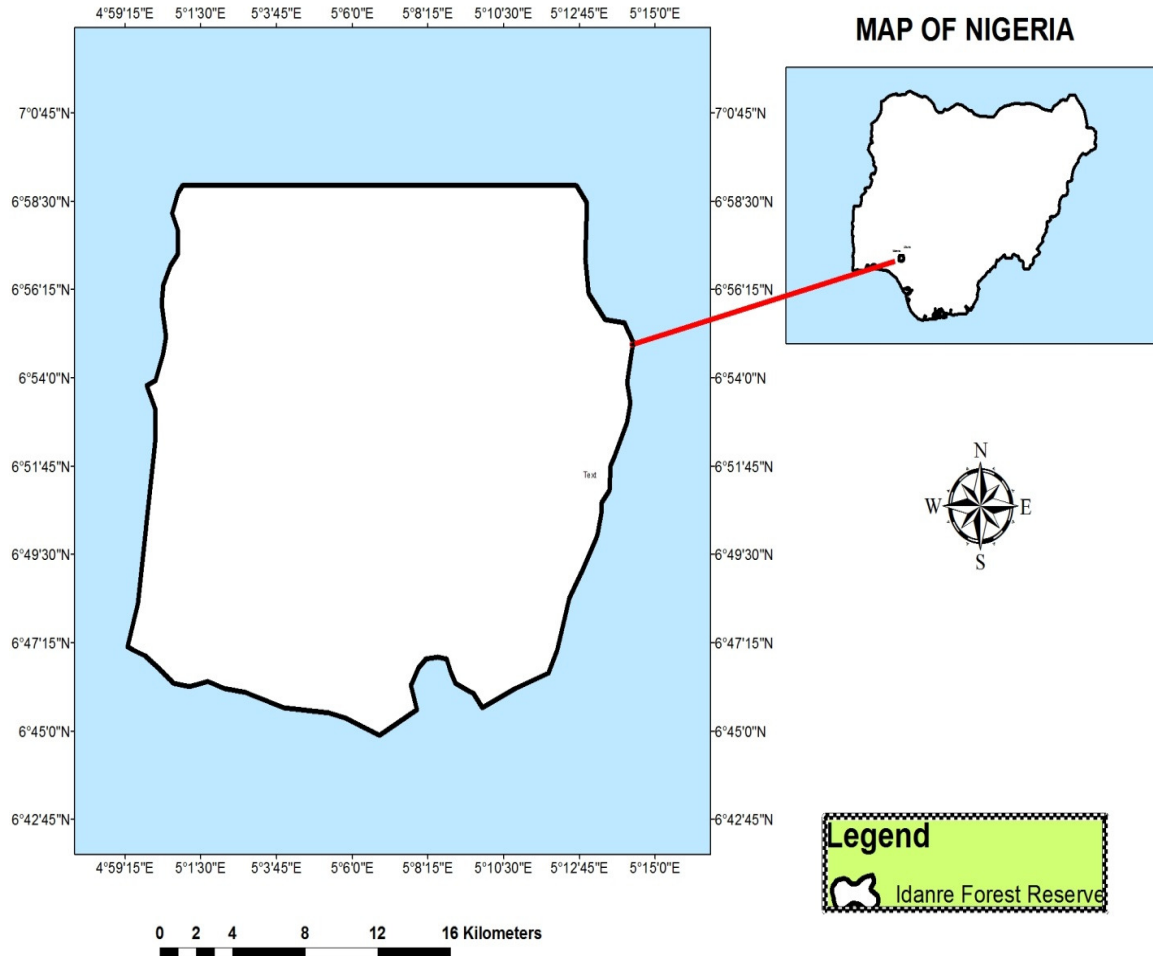


Figure 1: Map of Nigeria Showing Idanre Forest Reserve, Ondo State

**Data Collection**

A total of five transects were selected within the forest reserve covering a distance of 30.2km (A=6.0 km, B=4.0 Km, C=7.2 Km, D=8.0Km, E= 5.0Km).These transects were established along hunter’s trails and along natural landmarks such as streams. The survey was carried-out as described by Akinsorotan and Ogunjemite (2011). Censuses along these transects were conducted twice daily for two weeks each

month between the month of August and November 2014. Enumeration was done from 0600-1100h and 1500-1800h. The timing between the early hours of the day and evening, was chosen on the basis that animals starts feeding early in the morning and the evening animals comes to drink water and/or rest. Enumerators (the researcher and experienced hunters) walked quietly and slowly along these transects at a rate of 1.0km per hour covering a distance of one transect per

day. The period of traversed were interspersed with period of silence and watch to increase the possibility of detecting animal that might hide or flee upon the approach or movement of the observers (Buckland *et al.*, 1993).

All sighting indices used such as footprints ones sighted in the morning was marked or erased in order to avoid recounting of the same footprint more than ones on each transect traversed in the morning and evening respectively. For Feecal droppings and animals activities fresh signs were always left behind for any fresh dung and activities.

Analytical tools employed include frequency count and percentage. The student t-test analysis was used to compare sightings in the morning and evening surveys.

Encounter rate/ Sighting rate (ER)

$$= \frac{n}{L}$$

n = numbers of encounter/sightings observed from the transect

L = Length of transect line

## Results

### Species Composition

The different species of large mammals that were observed (using both the direct and indirect observation ) in the study includes bush buck (*Tragelaphus scriptus*), Forest buffalo (*Syncerus caffer nanus*), Maxwell duiker (*Cephalophus maxwelli*), Yellow-backed duiker (*Cephalophus silvicultor*), Mona monkey (*Cercopithecus mona*), White throated monkey (*Cercopithecus erythrogaster*) Red-capped mangabey (*Cercocebus torquatus*), Bush pig (*Potamochoerus porcus*), African civet (*Civettictis civetta*) (Table 1).

Table 1: Large mammals' Composition at Idanre Forest Reserve

Common name	Order	Family	Genus	Species	Sub-species
Forest buffalo	Artiodactyla	Bovidea	<i>Syncerus</i>	<i>Syncerus caffer</i>	<i>S. C. nanus</i>
Bush buck	Artiodactyla	Bovidea	<i>Tragelaphus</i>	<i>Tragelaphus scriptus</i>	
Maxwell's duiker	Artiodactyla	Bovidea	<i>Cephalophus</i>	<i>Cephalophus maxwelli</i>	
Yellow-backed duiker	Artiodactyla	Bovidea	<i>Cephalophus</i>	<i>Cephalophus silvicultor</i>	
Bush pig	Artiodactyla	Suidae	<i>Potamochoerus</i>	<i>Potamochoerus porcus</i>	
African civet	Carnivore	Canidae	<i>Canis</i>	<i>Civettictis civetta</i>	
Mona monkey	Primate	Cercopithecidae	<i>Cercopithecus</i>	<i>Cercopithecus mona</i>	
White-throated monkey	Primate	Cercopithecidae	<i>Cercopithecus</i>	<i>Cercopithecus erythrogaster</i>	
Red-capped Mangabey	Primate	Cercopithecidae	<i>Cercocebus</i>	<i>Cercocebus torquatus</i>	

### Sightings

A total of 148 sightings (both direct observation and indirect observations) were achieved in the 12 surveys carried out within the study period. One-hundred and nineteen (119) sightings were achieved through indirect indices (such as animal call, footprints, animal trails, and faecal droppings) and a total of 29 sightings of large mammals were achieved directly. The Maxwell duiker signs were the most commonly observed signs which were sighted 34 times (28.20%), the buffalo footprints were the second most sighted indices 30 times (25.20%). The bush pig signs were observed 24 times (20.17%). Other species signs observed includes bush buck with 22 observations, (18.49%), the African civets 8 observations (6.72%) and the yellow-back duiker 1 observation (0.84%), Table 1.

The large mammal sighted directly were three monkeys which include

*Cercopithecus mona*, *C. Erythrogaster* and *C. torquatus*. Only the *C. torquatus* has a different encounter rate 0.16 sighting/km but the *C. mona* and *C. erythrogaster* have the same encounter rate of 0.4 sighting/km. The Sightings in the morning were significantly different from those of the evenings ( $P < 0.05$ ,  $r = 0.86$ ) and there was strong correlation between the two period, Table 2.

Table 2: Sighting frequency of large mammals' signs (indirect indices) in Idanre Forest Reserve

Animal species	Frequency of signs (%)
<i>Syncerus caffer nanus</i>	25.21
<i>Tragelaphus scriptus</i>	18.49
<i>Cephalophus maxwelli</i>	28.57
<i>Cephalophus silvictor</i>	0.84
<i>Civettictis civetta</i>	6.72
<i>Potamochoerus porcus</i>	20.17

Table 3: Frequency of occurrence of Large Mammals signs between the morning and evening surveys in Idanre Forest Reserve

Animal species	Morning sightings (%)	Evening sightings (%)
<i>Syncerus caffer nanus</i>	60	40
<i>Tragelaphus scriptus</i>	68.18	31.82
<i>Cephalophus maxwelli</i>	58.82	41.18
<i>Cephalophus silvictor</i>	100	-
<i>Civettictis civetta</i>	100	-
<i>Cercopithecus mona</i>	66.66	33.34
<i>Cercopithecus erythrogaster</i>	66.66	33.34
<i>Cercocebus torquatus</i>	40	60
<i>Potamochoerus porctus</i>	50	50

Table 4: Encounter rate of large mammals' species sighted directly in Idanre Forest Reserve

Animal species	Number of troops sighted	Sighting rate/km	Relative frequency
<i>Cercophithecus mona</i>	12	0.40	0.41
<i>Cercophithecus erythrogaster</i>	12	0.40	0.41
<i>Cercocebus torquatus</i>	5	0.16	0.17

## **Discussions**

Although it is difficult to observe animals accurately in rainforest habitats, the results of this survey indicated that observing these species by their signs is feasible (Carrillo *et al.*, 2000). The Idanre Forest Reserve is one of the forest reserves in South-West Nigeria that is rich in large mammalian species diversity. Out of the nine (9) large mammalian species observed in the reserve, three were directly censured and others were through the indirect indices such as footprints, animal call, faecal droppings, animal trails and their activities. In the reserve, only three species of the primate species were sighted directly while four species of primates were recorded by Akinsorotan and Ogunjemite (2011) in Okomu National Park. They used both the direct and indirect method of survey for their studies. The species composition of large mammals in the reserve are similar to those of other forests in the region (Akinsorontan and Ogunjemite, 2011; Oates *et al.*, 2008).

Large mammalian species sightings are generally poor in rainforest environment and the condition in Idanre Forest Reserve is not an exception. However, encounter rate in the reserve ranks as one of the highest in Nigeria.

A 0.40 sightings/km each of Mona monkey and White-throated monkeys respectively translating to 0.4 individuals/km of the total transect length covered which is higher than the 0.22 sighting/km for Mona monkey in Okomu National Park as reported by Akinsorotan and Ogunjemite (2011). Invariably, using the kilometric index abundance (KIA) or encounter rate (ER) as used by Vincent *et al.* (1991) and Tsi *et al.* (2009)

this implies that the abundance of the Mona monkey and the White-throated monkeys are on the average in terms of the strength of the sighting rates at the Idanre Forest Reserve. It is also higher than an average of 0.14 sightings/km reported in Filinga range (core area) of Gashaka-Gumti National Park and 0.01 sightings /km in the Okwangwo division of Cross River National Park (ODA/WWF/CEC, 1990). Red-capped Mangabey encounter rate is 0.17 sightings/ km translating to 0.17 red-capped Mangabey/km of the total transects length covered in the survey which implies that the abundance of red-capped Mangabey is weak/low using kilometric index abundance (KIA) in Idanre forest reserve. The encounter rate of the animals sighted seems to be high in Idanre forest reserve thereby making it a special location for ecotourism activities to go thrive (Odewumi, 2004).

There are significant different between the morning and the evening sightings of the large mammals in the reserve as also reported by Akinsorantan and Ogunjemite (2011).

It was noted that all the primate species censured in this research work were together in clusters that is, different species crossing the territory of each other. This was due to different humanactivities such as agricultural activities, hunting and indiscriminate logging taking place within the forest reserve thereby reduces the habitat of these species.

Other large mammalian species were censured using the indirect method of observations. The Maxwell duikers were the most encountered with the sighting frequency of 28.5% then followed closely by the forest buffalo with 25.20% and

bush pig with 20.17%. Other animals sighted include the bushbuck producing 18.48%, jackal producing 6.72% and the threatened yellow-backed duiker producing 0.84%. The population structure of large mammals Idanre Forest Reserve favours more ungulates than others other than the primate community. In the study area the species sighted directly were sighted in the forested area of the reserve where human activities were less. This negates the work of Akinsorotan and Ogunjemite (2011) where these animals especially the primate community have been partially habituated and less frightened and could easily be seen by the tourists. Therefore, sighting of large mammalian population in Idanre Forest Reserve is hampered majorly by illegal human activities that are on the increase in the forest reserve on a day to day basis.

### **Conclusion and Recommendations**

Forest Reserves support varieties of large mammals' component in the rainforest environment. Therefore, from the studies it was revealed that large mammalian species diversity is of significant quantity in Idanre Forest Reserve in terms of their encounter rate as compared to some of the protected areas (PAs) in Nigeria.

The major factors affecting the abundance of these large mammalian species of the Idanre Forest Reserve are due mainly to habitat alteration as a result of agricultural activities, logging and hunting. All these anthropogenic activities reduce the home range of large mammals in the reserve thereby resulting into clusters of different species in a habitat which resulted into higher

demand on the habitat for the survival of large mammalian species of the reserve.

It is therefore pertinent to improve on the conservation of these large mammalian species of Idanre Forest Reserve. Therefore, effort should be made at all levels at enlightening the people living in close proximity to the reserve on the importance of conserving these species of animals and the overall impact it will have in improving their livelihood. Also protection of the forest vegetation and the fauna components should be considered.

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The footprint of *Civettictis civetta* in Idanre Forest Reserve



The footprint of *Syncerus caffer nanus* in Idanre Forest Reserve



The fecal droppings of *Cephalophus maxwelli*



The browsing activities of *Tragelaphus scriptus* in Idanre Forest Reserve



The activities of *Potamochoerus porcus* in the forest reserve