

# Preliminary data on forest elephants (*Loxodonta africana cyclotis*) in southwestern Nigeria

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## Abstract

Elephant numbers in Nigeria have decreased greatly and the rate of this decline cannot be established owing to the insufficiency of available data. The number of forest elephants in particular is especially difficult to determine because of the dense vegetation where they occur, and previous attempts have resulted in the reporting of conflicting estimates. This article describes current efforts to establish the status of forest elephants under ongoing projects for sustainable forest management in some protected areas in southwestern Nigeria. These studies report on the spatial distribution and status of elephants in the study areas and threats facing the remaining population; it also updates the information on the range of elephants in southwestern Nigeria.

The lack of knowledge of the population size and status of forest elephants in the country is a major obstacle in determining appropriate conservation needs and measures in the areas where they occur. Ensuring the continued survival of the remaining elephant populations will require up-to-date and accurate information to assist people in management to make strategic decisions for effective conservation.

## Résumé

Au Nigeria, le nombre d'éléphants a largement diminué et le taux de ce déclin ne peut pas être établi à cause de l'insuffisance des données disponibles. Le nombre d'éléphants de forêt en particulier est surtout difficile à déterminer à cause de la végétation dense où ils se trouvent, et les tentatives antérieures ont donné lieu aux rapports d'évaluations divergentes. Cet article décrit les efforts actuels d'établir la situation des éléphants de forêt sous les projets de gestion durable des forêts en cours dans quelques aires protégées au sud-ouest du Nigeria. Ces études font un rapport sur la distribution spatiale et la situation des éléphants dans les aires d'étude et les menaces auxquelles la population restante est confrontée; il met à jour aussi les informations sur l'habitat des éléphants au sud-ouest du Nigeria.

Le manque de connaissances sur la taille de la population et la situation des éléphants de forêt dans le pays est un obstacle majeur à l'établissement des besoins et des mesures de conservation appropriées dans les aires où ils se trouvent. Afin d'assurer la survie continue des populations d'éléphants restantes, il faut des informations récentes et exactes pour aider les gestionnaires dans la prise des décisions stratégiques en vue d'une conservation efficace.

## Introduction

Data on elephants in Nigeria are particularly lacking (L. Niskanen, pers. comm. 2006) with most of the available information being anecdotal, based on interviews and a few sighting reports of questionable reliability. For example, a total of 84 individuals was estimated by the Nigerian Forest Elephant Group (Ishola 1999) in the Omo Forest Reserve (elephants being the focus species of this organization, active between 1990 and 1999), while Mshelbwala cited

in AfESG–AED (2005) reported the presence of 30 individuals in the same reserve in 1998, thus providing conflicting population estimates of the species.

In addressing this lack of reliable information, I have been collecting data on forest elephants in protected areas of southwestern Nigeria since February 2007 (Ikemeh 2007 and Oates et al. 2008) as part of projects to assess wildlife and habitat in the Nigerian lowland forests. Although surveys were conducted in one national park and five forest reserves, only areas where information on elephants was collected are

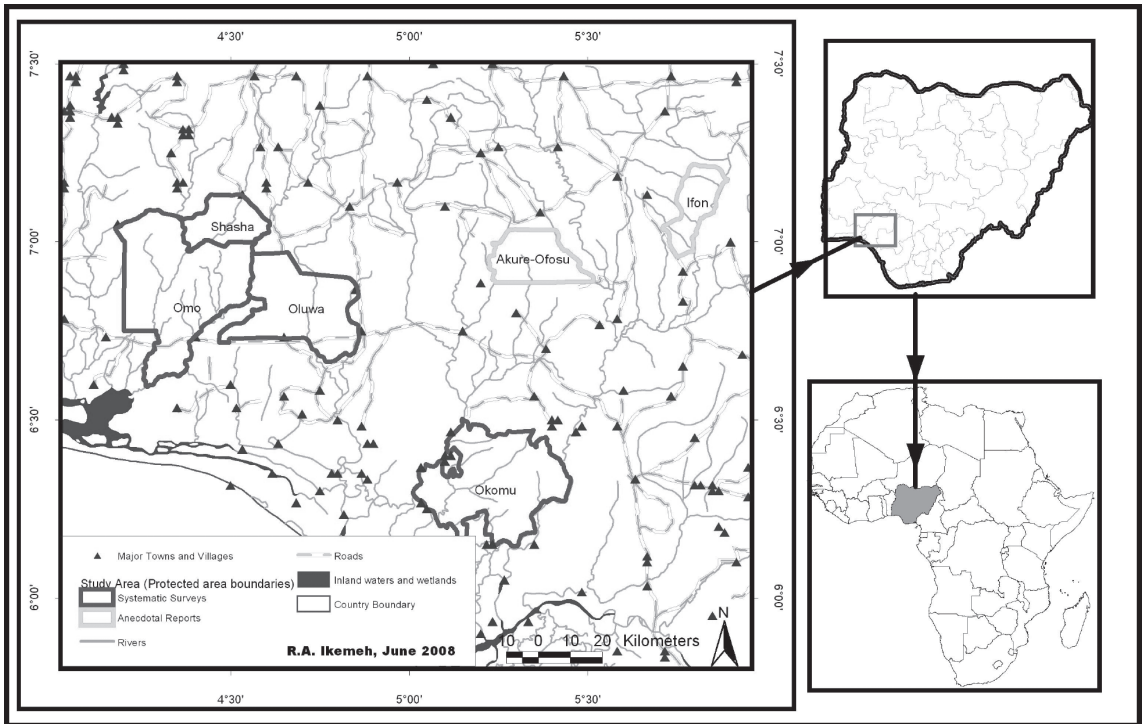


Figure 1. Map of the study areas and input zones.

featured in this paper. Specifically, these areas include the Okomu National Park and the contiguous Omo, Oluwa and Shasha Forest Reserves. Additional information from an ongoing survey in Ife Forest Reserve undertaken by another team of researchers from the Nigerian Conservation Foundation, as well as reports from State Ministry officials in Akure-Ofosu Forest Reserve are also used in this paper to illustrate the patchy distribution of forest elephants in southwestern Nigeria. The information collected provides an index of relative elephant densities based on rates of encounter with signs of their presence and a better understanding of the species' spatial distribution in each of the areas. When these studies are complete, the accumulated data will be used to determine relative densities with an estimation of confidence limits and to assess elephant-habitat interactions (e.g. whether there is indeed habitat preference and/or a relationship between elephants and the nearest human settlement). The final report is expected to help formulate sustainable management decisions in Okomu National Park and the forest reserves.

## Study areas

The study areas include Okomu National Park (182 km<sup>2</sup>), which is located in the centre of the larger Okomu Forest Reserve (1,121 km<sup>2</sup>) in Edo State and a block of five contiguous Forest Reserves: Omo (1325 km<sup>2</sup>), Oluwa (827 km<sup>2</sup>), Shasha (310 km<sup>2</sup>), Ife (142 km<sup>2</sup>) and Ago-Owu (240 km<sup>2</sup>). These areas extend from eastern Ogun, through western Ondo to southern Osun States and are administered by the Ministry of Agriculture and Natural Resources of the various States. Information on elephants in the region was also collected from Ife and Akure-Ofosu Forest Reserves in Ondo State (Fig. 1). These states are located in southwestern Nigeria and lie west of the Niger River. The vegetation of the area is predominantly mixed, moist, semi-deciduous rainforest (Isichei 1995). However, large parts of the reserves have already been replaced by mono-culture tree plantations such as *Elaeis genesis*, *Gmelina arborea* and *Tectona grandis* (Isichei 1995; Ikemeh 2007b; Oates et al. 2008).

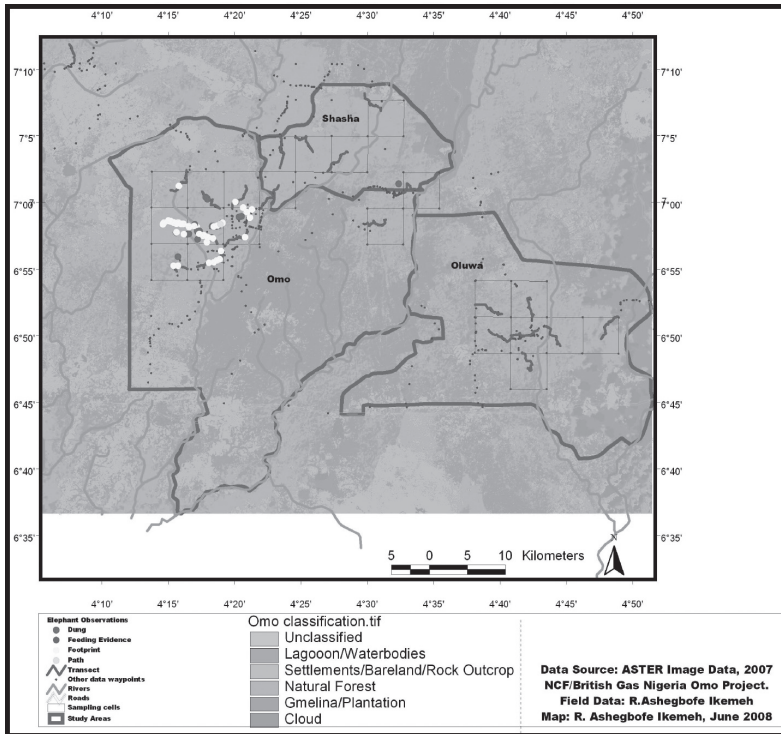


Figure 2. Map of the contiguous reserves—Omo, Oluwa and Shasha Forest Reserves on a false colour classified ASTER satellite image, showing elephant observations in relation to survey routes and other transects and recce waypoints.

## Materials and methods

Satellite imagery was used in planning and executing the survey using a LANDSAT-7 Enhanced Thematic Mapper (ETM) acquired in 2003 with a spatial resolution of 30 m and an ASTER composite acquired in January 2000–March, 2007 with a resolution of 15 m including Google Earth 2008. A Trimble Geocollector XM pocket PC configured with ArcGIS 9/Arcpad 7.0.1 was uploaded with the relevant imagery overlaid with other spatial data including reserve boundaries, rivers and road networks, allowing data collection in real time. For groundtruthing (ground data collection), a simple handheld GPS 60CSx was used. The accuracy of the GPS receiver used is  $\pm 5\text{--}25$  m when it is moved at a speed of 0.1 m per second and when satellites acquire numbers from two to four.

The surveys involved a series of formal and informal interviews with local resource users, researchers in the area and forestry staff of the various Ministries of Agriculture and Natural Resources. Socio-economic and socio-cultural/political data were derived from

interviews and observations. Reconnaissance walks ('recces') were carried out in all of the study areas following available roads and trails. In the most recent studies in Omo, Oluwa and Shasha Forest Reserves, recces were combined with transects selected as outlined below. The forest reserves were superimposed on a 5 x 5 km grid using Arcview GIS and those cells falling within forest fragments (identifiable from their spectral response on the satellite images) were selected as part of our sampling area (Fig. 2). Thus, 5 km transects were followed using a hip chain for measuring the distance walked along a random bearing from the edge of each cell towards the centre of the cell. The data collection protocol involved recording habitat-related data such as land cover and land use information at 200 m intervals and at a radius of 25 m in every direction from the point. Although direct

observations of elephants have not been recorded so far, signs such as footprints, dung, trails and feeding evidence were observed and subsequently localized along the transects/survey routes. Sightings and signs of human activities and of other large mammals were recorded also.

## Results and discussion

Forest elephants were noted in Omo between January and April 2008. Our results show that the number of elephant observations per recce is 3.9 or 0.75 per km, but this number is only indicative for the forest fragment on the western part of the reserve (Oates et al. 2008). Elephants also occur in the Ifon Forest Reserve and possibly in the Shasha Forest Reserve (where only an old footprint was recorded close to the boundary of Omo) but they are reported to be present by local hunters. Elephant signs were also observed in the Okomu National Park, mostly in its southern part although their range includes the forest reserve. Observations outside the park were rare. Elephants

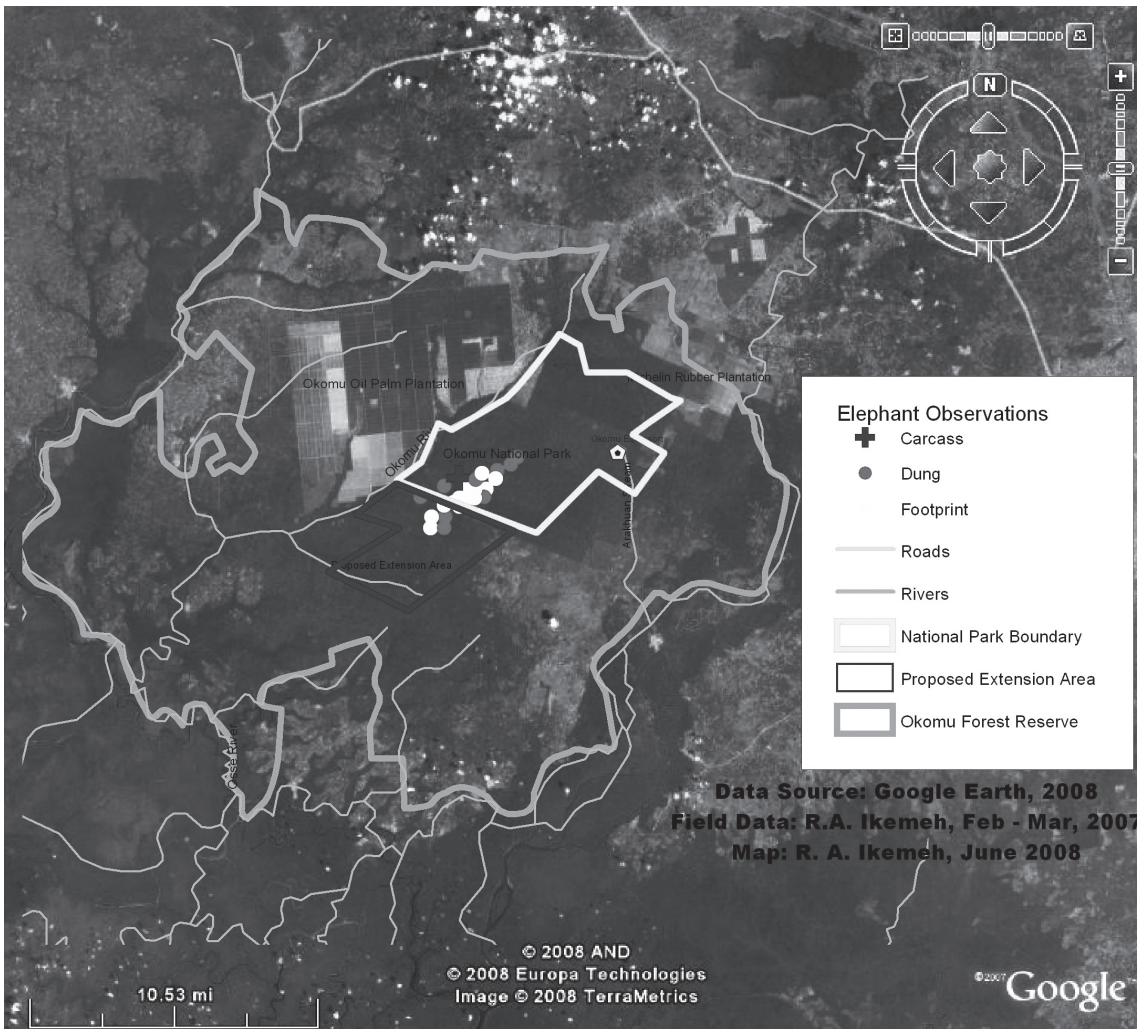


Figure 3. Map of the Okomu Forest Reserve showing the location of the national park and type of elephant observations on a Google Earth derived satellite image.

have also been reported in Akure-Ofosu Forest Reserve, where a sighting was made in 2007 by A. Ajayi, Senior Forestry Official, Ondo State; (pers. comm. 2008). There was no evidence of elephants in Oluwa Forest Reserve where they are believed to be locally extirpated, although locals claim the area supported elephants until 2005 when the last sighting was made (Ikemeh 2008).

With the increasing conversion of forest into plantations and farmlands even within the reserves, elephants conflict with people as they occasionally move between forest fragments, trampling and raiding crops. Hunting of elephants is reportedly uncommon in Omo, which the locals attributed to the lack

of automatic weapons to kill an animal the size of an elephant, since what they have at their disposal are traditional guns using powder bullets. In Okomu, a one year old elephant carcass was recorded during the survey. The cause of death could not be determined but it was unlikely to have been due to natural causes considering that the elephant was not old according to the species' age class parameters described in White and Edwards. Park authorities believe that the hunting of elephants has greatly reduced and claim that there have been no reports of elephant poaching since the area was upgraded to a National Park in 2000.

Trade in ivory continues to threaten elephants, as my investigations confirmed a thriving ivory trade

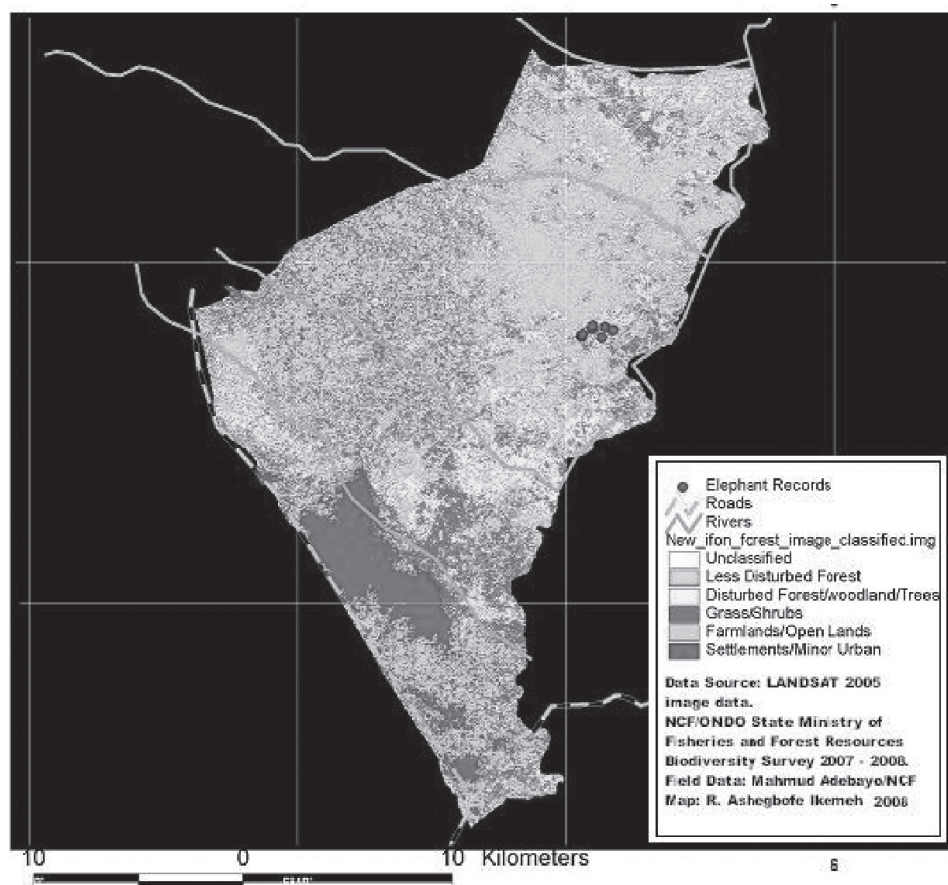


Figure 4. The Ifon Forest Reserve on a classified LANDSAT 2000 image, showing the locations of signs of elephants.

Table 1. Summary of forest elephant data collected during the studies

Area	Size (km <sup>2</sup> ) (Source: IUCN database of protected areas)	Area of natural habitat remaining (km <sup>2</sup> )*	Occurrence	No. of signs	Km walked in recces (R) and transects (T)	Source or survey period
Omo F.R.	1324	381.2	Resident	75	165 (R&T)	Sept 2007–Apr 2008
Okomu N.P. (F.R.)	182 (1121)	198.2	Resident (Seasonal)	23	50 (R)	Feb–Mar 2007
Ifon F.R.	271	-	Resident	20	-	NCF/Survey 2007–2008
Akure–Ofosu	394	-	Reported	-	-	Forestry official report, 11th February 2008
Oluwa F.R.	827	347.9	Formerly present	-	112 (R&T)	Local report, 16th February 2008
Shasha F.R.	309	240.8	Sighted	1	50 (R&T)	RAI/Survey 2008

\* Calculated from 2007 ASTER satellite imagery and Google Earth images in the case of Okomu.

inside Lagos where one elephant tusk can sell for NGN 500,000, the equivalent of USD 4200. However, it is doubtful that local elephants provide the major source of supply for this trade even though they are the closest to Lagos (Corouble et al. 2003).

Forest elephants in southwestern Nigeria are disappearing from their former range and are primarily threatened by habitat fragmentation and increasing human occupation and activity within the forest reserves. In the face of this trend, detailed studies on the identified populations to determine their ranging patterns and actual sizes are a priority. The presently reported studies are ongoing, and will collect and aggregate all available information to determine the density and abundance of elephants in Omo Forest Reserve and Okomu National Park since these areas support the remaining significant populations of elephants in southwestern Nigeria.

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## Addendum

Following a survey of the Idanre Forest Reserve in February 2009, additional data on elephant distribution were derived from field studies and local reports. Survey results confirmed the presence of elephants in Akure Ofoosu and Idanre Forest Reserves. The Omosu and Ogbesse Forest Reserves in Edo and Ekiti States were identified as probable range because local people's accounts were not judged to be reliable (Fig. 5).

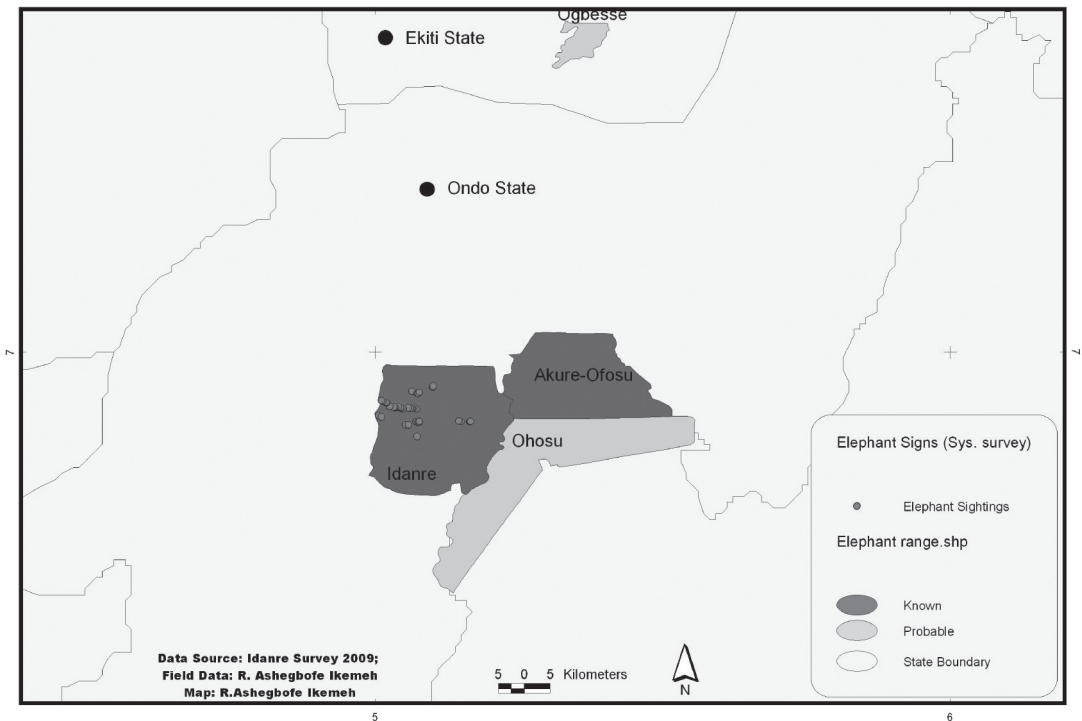


Figure 5. Distribution range for forest elephants in southwestern Nigeria (Survey 2009).

## References

- African Elephant Database, 2005. IUCN/SSC African Elephant Specialist Group.
- Courouble M, Hurst F, Millike T. 2003. *More Ivory than Elephants: Domestic Ivory Markets in Three West African Countries*. TRAFFIC East/Southern Africa.
- Ikemeh AR. 2007a. *Elephants in Okomu National Park, Southwestern Nigeria*. Leventis Conservation Foundation, Lagos, Nigeria. Unpublished.
- Ikemeh AR. 2007b. *Survey of the Omo-Oluwa-Shasha Forest Complex, South Western Nigeria: A Preliminary Report*. Nigerian Conservation Foundation, Lagos, Nigeria. Unpublished.
- Ikemeh AR 2008. *A Survey of the Rainforests in Ogun, Ondo and Osun States in southwestern Nigeria to Assess Options for Sustainable Conservation*. February Progress Report. NCF-BG Omo-Oluwa-Shasha Forest Project, Nigerian Conservation Foundation, Lagos, Nigeria.
- Ikemeh AR. 2009. Status of the Idanre Forest Reserve, Ondo State, Nigeria: A February 2009 Survey, Leventis Foundation Nigeria. Unpublished.
- Ishola O. 1999. Paignton Zoo Education Curriculum (revised in 2003), Paignton Zoo Environmental Education Project, Omo Forest Reserve, SW, Nigeria. Unpublished.
- Isichei AO. 1995. Omo Biosphere Reserve, Current Status, Utilization of Biological Resources and Sustainable Management (Nigeria). Working Papers of the South-South Cooperation Programme on Environmentally Sound Socio-Economic Development in the Humid Tropics. UNESCO, Paris.
- Nigerian Conservation Foundation, 2007. *Biodiversity Survey of the Ifon Forest Reserve, Ondo State*. A technical report submitted to the Forestry Department of the Ministry of Fisheries and Forestry Resources, Ondo State. Unpublished.
- Oates JF, Ikemeh AR, Ogunesan AA, Begri RA. 2008. *A Survey of the Rainforests in Ogun, Ondo and Osun States in SouthWestern Nigeria to Assess Options for Sustainable Conservation*. Nigerian Conservation Foundation, Lagos, Nigeria. Unpublished.
- White L, Edwards A. (eds.). 2000. *Conservation Research in the African Rain Forests: A Technical Handbook*. Wildlife Conservation Society, Bronx, New York.