



**STRENGTHENING MONITORING SYSTEMS FOR ADAPTIVE
MANAGEMENT AND PROTECTION OF FOREST ELEPHANTS IN
OMO FOREST RESERVE, SOUTHWESTERN NIGERIA**

BEING A FINAL PROJECT REPORT

By

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Executive Summary

The report chronicles the activities carried out on the project "Strengthening Monitoring Systems for Adaptive Management and Protection of Forest Elephants (*Loxodonta cyclotis* Matschie, 1900) in Omo Forest Reserve, Southwestern Nigeria". The specific objectives were to: (i) recruit and train elephant monitoring teams to monitor and prevent illegal activities in elephant sanctuary and adjoining areas; (ii) establish monitoring systems for protection of elephants within the project area; (iii) secure and maintain the habitat of the elephant including their migratory corridors within the project area and; (iv) consolidate the education and awareness raising programme on elephant conservation and management among key stakeholders including policy makers, local communities and other interest groups.

Omo Forest Reserve (OFR), which is located between longitudes 4°19' - 4° 40'E and latitudes 6° 35' - 7° 05'N in the Ijebu East and North Local Government Areas of Ogun State, southwestern Nigeria harbours one of the last remaining populations of forest elephants in the country. Interventions from the government and various conservation agencies in order to mitigate threats to the rich biodiversity of the reserve have become inevitable. Part of these interventions involved establishing a wildlife sanctuary covering an area of about 37,500ha \approx 29% of the forest reserve. The wildlife sanctuary is made up of elephant (30,000ha \approx 23%) and chimpanzee (7,500ha \approx 6%) areas or camps. However, the management of the areas until recently has been fortuitous owing to ineffective institutionalization and poor law enforcement to halt most of the anthropogenic activities affecting biodiversity conservation.

The Rufford Foundation has supported past efforts and initiatives on conservation and protection of elephants in the area. The need to establish and strengthen monitoring systems for adaptive management and protection of the forest elephants, as well as the need to secure and maintain the habitat of the elephant including their migratory corridors necessitated a Rufford Completion Grant on the project, "Strengthening Monitoring Systems for Adaptive Management and Protection of Forest Elephants (*Loxodonta cyclotis* Matschie, 1900) in Omo Forest Reserve, Southwestern Nigeria".

In executing the project, the need to step up sensitivity and awareness on elephant conservation in communities within the project area was further established. It was counseled that the persistence of the forest elephants and other groups of biodiversity can be ensured only if human pressure is reduced within the protected area. Consequently, the project team carried out a number of sensitivity and awareness campaign on elephant conservation in communities within the project area.

The Forest Elephant Protection Initiative employed local community scouts to arrest the further expansion of illegal activities in the protected area. The Ogun state government in its support also employed and deployed some of its forestry officers to the project to support the local scouts. All employed officers were trained, equipped and carried out law enforcement activities in the protected areas of the reserve. This step has helped to reduce the rate of illegal activities in elephant

sanctuary and adjoining areas. In the same vein, the boundary areas of elephant range which required protection from encroachers were mapped for installation of patrol stations, signage and beacons. Signboards were thereafter produced and installed in the reserve.

In order to improve patrol efforts and activities, relevant scientific materials were acquired and training sessions conducted on how to use and manipulate them. Training sessions focused on the use and manipulation of the GeoTracker and Kobo Collect Software for field data collection with intensive practical sessions for field testing. The training was tailored to ensure that rangers have the capacity to collect accurate and reliable information and are able to carry out preliminary analysis to provide decision support to meet conservation needs. Subsequently, a customized data collection and monitoring system for ranger patrols based on the GeoTracker software package was developed and deployed. This system allows for consistent and rapid collection of geo-referenced data by rangers, along with automated tracking of patrols and easy analysis of patrol data. This has continued to help in gathering important data in the biodiversity conservation work in more systematic and time efficient ways. It has also helped improve rangers tracking capabilities of the remaining elephants in the forest for optimized protection.

As part of the project initiative, elephant conservation project activities in Nigeria as supported by the Rufford Foundation were put together in form of a documentary. The documentary is titled, *In the footprints of a megaherbivore...the Elephants of Nigeria*. This was to showcase the efforts and contributions of the project leader through the Rufford Foundation at ensuring the protection of elephants and other wildlife species in the country. It was also aimed at calling the attention of stakeholders, particularly the government towards muscling up the right political will at protecting biodiversity species in the country.

Some of the practical conservation outputs of the project include: securing and maintaining the habitat of forest elephant as well as their migratory corridors within the project area; consolidating the education and awareness raising programme on elephant conservation and management among key stakeholders; contributing to capacity building of rangers involved in elephant monitoring through training sessions on monitoring and prevention of illegal activities in elephant sanctuary and adjoining areas; raising the morale and motivation of rangers in frontline of conservation activities in the project area; procurement of equipment and facilities for establishing monitoring systems for protection of elephants within the project area; enhanced patrol activities and establishment of monitoring systems for protection of elephants within the project area; and significant increase in visitation by tourists, researchers and students into the elephant sanctuary owing to increased level of protection and the generally enhanced integrity of biodiversity in the area.

1. Introduction

The future of many high-value charismatic species and the ecosystems they inhabit across Africa are severely threatened as a result of various anthropogenic activities, including high levels of poaching and habitat destruction (Amusa et al., 2017; Henson et al., 2016). Protected areas have been viewed as remedy to this malaise (Bruner et al., 2001; Terborgh and van Schaik, 2002), with two complimenting approaches often used: one, being the implementation of a robust exclusionary punitive law enforcement inside core protected areas and the other, being the collaborative community-based conservation in areas outside the core protected areas (Nyirenda and Chomba, 2012). The former (law enforcement within and around protected areas) is at the frontline of any site's conservation efforts as their effectiveness is one of the most important factors in providing an operative deterrent to illegal activities in an area (Henson et al., 2016).

Effectiveness of protected areas have been found to be significantly correlated with the level of deterrents to illegal activities (Bruner et al., 2001). Improved law enforcement efforts are associated with a reduction in illegal activities (Jachmann, 2008; Martin, 2010; Leader-Williams, 1990). In contrast, poor law enforcement efforts at addressing illegal activities in protected areas have been linked to declines in wildlife populations (Basset, 2005; Ogutu et al., 2011). Given the place and importance of law enforcement to conservation efforts, a number of initiatives have emerged to support management decisions on monitoring and patrol activities in and around protected areas. These range from GIS spatial analysis of illegal activities, use of CyberTracker and SMART as well as deployment of ICT, including the use of tablets and smartphones. All of these have opened up increasing opportunities in the field of forest monitoring, law enforcement and biodiversity conservation.

In this report, we document the activities carried out on the project "Strengthening Monitoring Systems for Adaptive Management and Protection of Forest Elephants (*Loxodonta cyclotis* Matschie, 1900) in Omo Forest Reserve, Southwestern Nigeria". The specific objectives were to: (i) recruit and train elephant monitoring teams to monitor and prevent illegal activities in elephant sanctuary and adjoining areas; (ii) establish monitoring systems for protection of elephants within the project area; (iii) secure and maintain the habitat of the elephant including their migratory corridors within the project area and; (iv) consolidate the education and awareness raising programme on elephant conservation and management among key stakeholders including policy makers, local communities and other interest groups.

2. Materials and Methods

2.1 Description of Project Site

Omo Forest Reserve (OFR) is located between longitudes 4°19' - 4° 40'E and latitudes 6° 35' - 7° 05'N in the Ijebu East and North Local Government Areas of Ogun State (Figure 1). It was gazetted in 1925 as part of the old Shasha forest reserve of southwestern Nigeria. It covers an area of about 1,305km² forming common boundaries with Osun, Ago-owu and Shasha forest reserves in Osun State and Oluwa forest reserve in Ondo State, all of which also share some common

natural endowments (Amusa, 2015). It is a mixed moist, semi-evergreen rainforest in the Congolian sub-unit of the Guinea-Congolian Centre of Endemism or Phytochorion (Ola-Adams, 2014). The altitude ranges between 15m and 150m above the sea level, mainly dominated by an undulating topography of up to 15% slope. The rainy season in OFR usually commences in March. The mean annual rainfall in the area ranges from about 1600 to 2000 mm with two annual peaks in June and September, with November and February being the driest months (Isichei, 1995). Temperature ranges from 32.15⁰C to 21.40⁰C and a minimum relative humidity of 76.34 % (Adebisi, 2004).

The forest reserve is inhabited by people of several ethnic groups, the dominant one being the Yoruba of the Ijebu extraction. Most parts of the forest are disturbed with a substantial part converted to monoculture plantations of the fast growing exotic *Gmelina arborea* tree. The Nigerian government in 1946 established a 460 ha Strict Nature Reserve (SNR) within the reserve. It was upgraded to a Biosphere Reserve (BR) in 1977 by UNESCO owing to its richness in biological diversity (Obioho, 2005). It is an IUCN category IV reserve. It was, therefore, expected to be a managed nature reserve/wildlife sanctuary with several objectives that are aimed at protecting biodiversity but permitting human use where this is compatible with forest conservation. Nevertheless, the ecological integrity of the reserve is threatened by increasing migrant farmers and high rate of logging operations among other anthropogenic activities.

In spite of the situation described above, OFR still harbours one of the last remaining populations of elephant, chimpanzee and white throated monkeys in the southwestern part of Nigeria. Interventions from the government and various conservation agencies (Nigeria Conservation Foundation, Paington Zoo, UK and Pro-Natura International Nigeria) in order to mitigate threats to the rich biodiversity of the reserve have become inevitable. Part of these interventions involved establishing a wildlife sanctuary covering an area of about 37,500ha \approx 29% of the forest reserve. The wildlife sanctuary is made up of elephant (30,000ha \approx 23%) and chimpanzee (7,500ha \approx 6%) areas or camps. However, the management of the areas until recently has been fortuitous owing to ineffective institutionalization and poor law enforcement to halt most of the anthropogenic activities affecting biodiversity conservation. The Rufford Foundation has supported past efforts and initiatives on conservation and protection of elephants in the area. There is a need to establish and strengthen monitoring systems for adaptive management and protection of the forest elephants. There is a further need to secure and maintain the habitat of the elephant including their migratory corridors.

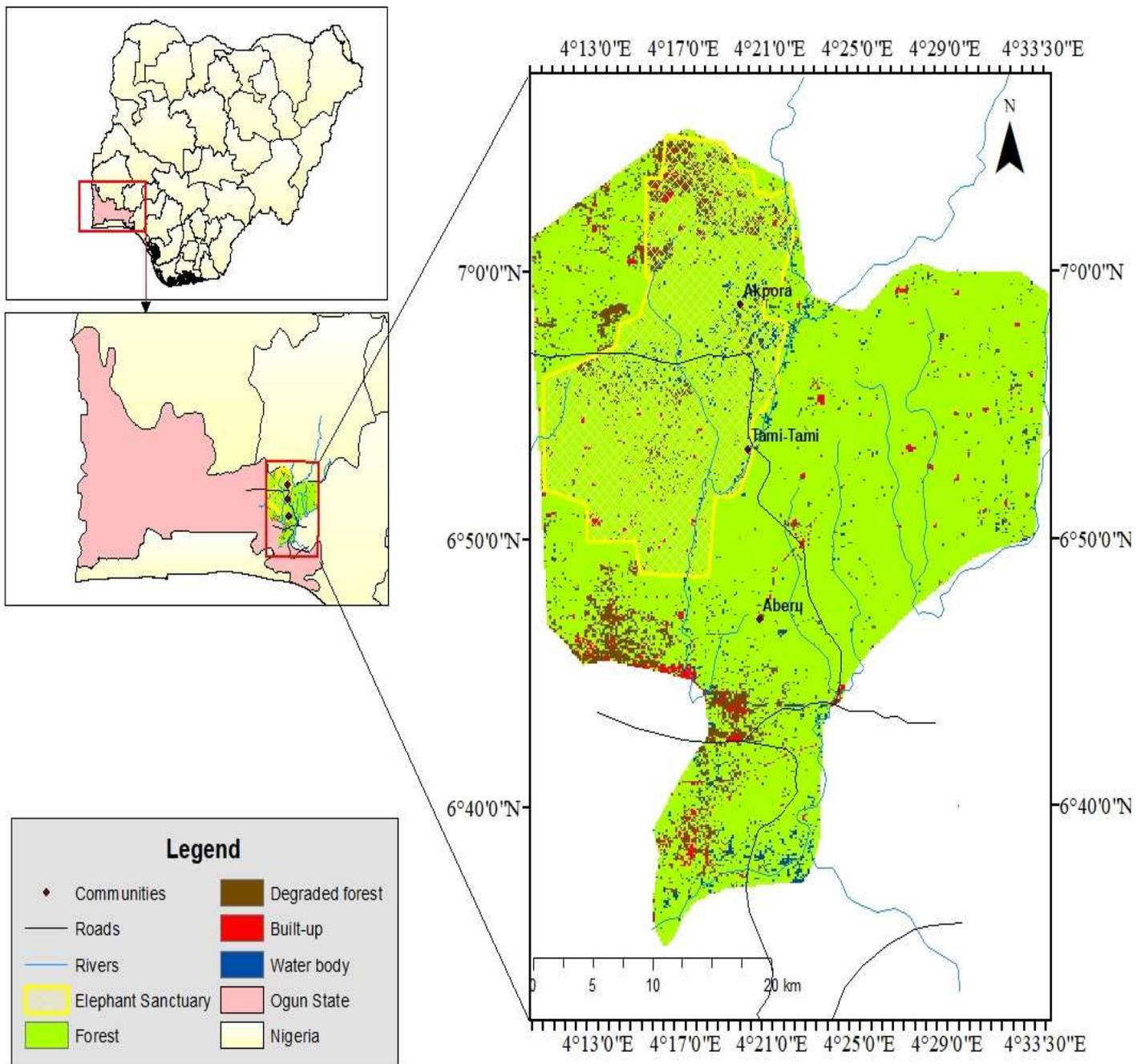


Figure 1: Map of Omo forest reserve (Left-hand corner inset shows the elephant sanctuary)

2.2 Field Activities

2.2.1 Project planning and setting out

The project activities began with a review of project objectives, identifying possible challenges/constraints, and delimitations to successful project implementation. This involved a number of meetings between the project team and the Nigerian Conservation Foundation (NCF) on one hand, as well as the project team and some local communities considered critical to successful implementation of the project on the other.

The meetings between the project team and the NCF focused on modalities for implementing the project objectives and its deliverables. Duties and roles towards achieving these objectives were assigned among team members. Cost implications and logistics on proposed activities were also discussed. The implementation of SMART as a monitoring system for protection of elephants within the project area was further deliberated upon. It was observed that there is need to put on hold the operation of SMART owing to the fact that the NCF, Wild Planet Trust and other supporting partners of Forest Elephant Protection Initiative in the project area are already discussing requirements and timeline required to implement SMART in Omo Forest Reserve on a long term sustainable basis.

2.2.2 Stepping-up sensitivity and awareness on elephant conservation

The need to step up sensitivity and awareness on elephant conservation in communities within the project area was further established. There was also the issue of illegal communities and the challenge they pose to elephant conservation. It was observed that the major challenge to elephant conservation in the project area come from members of illegal communities who continuously purchase farming rights from community heads generally called the *Baale*. These communities are deemed illegal as they do not exist in the historical maps of the forest reserve. They also do not have documents that confer any legality on their existence. However, their removal is subject to the willingness of the government to do the needful. It was recommended that the persistence of the forest elephants and other groups of biodiversity can be ensured only if human pressure is reduced within the protected area.

Meanwhile, it was further observed that there has been mass exit of elephants from the reserve to adjoining communities. Since the event, the government halted all logging activities within the reserve, though farming activities continued in some of the core area of the reserve. This again, only reiterates the fact that the most potent way forward for survival of elephants in the project area is to restore the forest habitat by halting all activities that destroy the protected areas. This calls for effective joint action in the removal of illegal communities from the core of the reserve.

In the intervening time, the project team in November, 2019 carried out another round of sensitivity and awareness campaign on elephant conservation in communities within the project area. The communities/enclaves visited were those

wherein elephants have been reportedly sighted in recent time. These include Atikiriji-odo and Ogunbakin, two communities at the edge of the Omo forest reserve. These enclaves were prioritised as it has been found that the elephants are leaving the preferred core of the habitat where vegetation is being decimated and moving to these edges where farms are already established and the chances of finding human grown foods are high.

The sensitization and awareness campaign involved a preliminary visit to these communities. Meetings were held with the heads of the communities who then mobilized members of their communities for the event. The sessions were carried out in two major languages, Yoruba (which is the major language spoken in the project area) and Pidgin English (spoken largely by indigenes and non-indigenes living in the community). The message focused on the need to conserve the elephants and protect the remaining forest which is the preferred habitat of these elephants. There was also the emphasis on the status of the elephant and the role everyone has to play in preventing the local extirpation of the African forest elephant. Finally, there was an interactive session on the role of the people in the event of an elephant invasion or encounter, as well as measures to prevent human-elephant conflicts.

Generally, the outreach programmes were designed to increase understanding of elephant conservation issues, exchange opinions and experiences, and establish a dialogue among sectors of the community. Overall, the outreach has a huge potential towards contributing to the conservation of elephants and other endangered species. The receptions in the communities visited were homely and community members were generally enthusiastic. It was an investment for the future.

2.2.3 Recruitment and training of rangers

The Forest Elephant Protection Initiative in the project area is supported by several partners including the Rufford Foundation, NCF, Wild Planet Trust and others. Project activities are carried out in partnership with the government. In order to control and arrest the illegal activities occurring in the project area with respect to the forest elephants, the project employed local community scouts to arrest the further expansion of illegal activities in the protected area. The Ogun state government in its support also employed and deployed some of its forestry officers to the project to support the local scouts. All employed officers were trained, equipped and started patrols and enforcement in the protected areas of the reserve. Culprits when caught were booked and transferred to the Ministry of Forestry of Ogun state. This step has helped to reduce the rate of illegal activities in elephant sanctuary and adjoining areas.

2.2.4 Securing and maintaining the habitat of the elephants including their migratory corridors within the project area

The boundary areas of elephant range which required protection from encroachers were mapped for installation of patrol stations, signage and beacons. Signboards

were produced and installed in the reserve. It is hoped that these will further serve as education and awareness signs for illegal farmers and settlers to steer clear of elephant ranging areas and habitat.

PHOTO SPEAK

Setting-out, sensitization and awareness campaign on forest elephant conservation in the project area



Recruitment and training of rangers



Field Rangers under The Forest Elephant Protection Initiative/Project



Rangers on Patrol within the Project Area



Arrest of a Trespasser within the Project Area



Confiscated Traps and Arrested Hunter within the Project Area



2.2.5 Patrol activities for monitoring and arresting illegal activities in project area

The Forest Elephant Protection Initiative has ten (10) rangers actively working on the field with two (2) managers and one (1) rangers' supervisor. The rangers operate on shift of two teams with a team comprising five rangers. Patrol activities are carried out by the rangers on foot and motorbikes. The rangers make use of intelligence report, road block, stop and search, ambush and at times joint patrol with the government's Safety Corps in some locations within the project area. Field reporting of daily events and activities were captured in field notebooks, use of camera, video recording and taking of GPS coordinates of incidence locations. Rangers are empowered to stop and prevent all forms of encroachments into the elephant sanctuary. These encroachments could be in form of farming, hunting, logging and trespassing within the elephant sanctuary.

2.2.6 GeoTracker applications for evaluating patrol activities in project area

In order to improve patrol efforts and activities, there was the need to acquire relevant scientific materials and conduct training sessions on how to use and manipulate them. Training sessions focused on the use and manipulation of the GeoTracker and Kobo Collect Software for field data collection with intensive practical sessions for field testing. The training was tailored to ensure that rangers have the capacity to collect accurate and reliable information and are able to carry out preliminary analysis to provide decision support to meet conservation needs. The training methodology had to do with instrument manipulation, data collection, data download, data export and import from and to other software programmes and how to carryout preliminary analysis on the collected data. Key elements handled during the training included but were not limited to; presentation on what a GeoTracker is, why the GeoTracker, the major features and functionalities, how to use the GeoTracker for data collection in the field and how to manage and maintain the GeoTracker. Prior to the beginning of each training session were the installations of various software and databases which were at same time synchronized into different handheld smart phones and laptop computers. The training sessions involved presentations, discussions, a question and answer session and lastly an intensive practical field exercises on manipulation of the GeoTracker System.

PHOTO SPEAK

Training session on the use of GeoTracker and Kobo Collect Applications



Project Team Member Inspect Camera Trap in Elephant Sanctuary



Encounter with Fresh Elephant's Dung by Rangers



2.2.7 Procurements of equipment and materials for patrol activities in project area

Working as rangers protecting flagship species like the elephants and their habitats is not an easy task. Trainings on new technologies, methods and strategies to achieve better results lighten the load a bit. In furtherance of our work, We continued to engage rangers on the use of Mobile Technologies in their work. GPS enabled android phones with power banks and scandisk memory cards were purchased to help data collection. A customized data collection and monitoring system for ranger patrols based on the GeoTracker software package was developed and deployed. This system allows for consistent and rapid collection of geo-referenced data by rangers, along with automated tracking of patrols and easy analysis of patrol data. This has continued to help in gathering important data in the biodiversity conservation work in more systematic and time efficient ways. It has also helped improve rangers tracking capabilities of the remaining elephants in the forest for optimized protection. Part of funds received from Rufford Foundation was also used to procure new motorbikes for improve rangers policing and general mobility in the forest. In addition, a desktop computer was purchased and set up at the Elephant Project Initiative Office within the forest reserve. This is to have a central-based system to collate field data especially on patrols and biomonitoring. Part of the fund was also used to support provision of solar system units at the

project office in J4 area of Omo Forest Reserve and a newly constructed rangers station funded by African Forest Elephant Foundation.

PHOTO SPEAK

Desktop computer system for a central-based system to collate field data on patrols and biomonitoring



Motorbike for improve rangers policing and general mobility in the forest



Mobile solar system unit at a newly constructed rangers station



GPS enabled android phones with power banks



2.2.8 Data collection on illegal activities in elephant sanctuary and adjoining areas using the GeoTracker system

Illegal activities and elephant sighting in and around the elephant sanctuary of Omo Forest Reserve were monitored through data collected by rangers while on patrol activities using the GeoTracker system. Patrol routes can be viewed as transects with unfixed width used to collect information on indicators of illegal activities and animal

observations. During the patrol activities, standardized data sheets were used to keep records of the numbers of staff on patrol; the duration of the patrol; the area traveled; the types, quantity, and locations of illegal activities encountered; and the numbers of elephants or their indices encountered.

Given that patrol movements should be unpredictable by nature, the rangers have been trained to randomize patrol movements as much as practically feasible, both to optimize impact of law enforcement, and to enable statistical inference from monitoring data. The patrol routes and the location of all encounters are normally marked using the GPS enabled android phones. These are later overlaid on a base map of the project area. Patrols take place either during the hours of day time (day patrol), night time (night patrol), or both (long patrol).

For elephant sightings/indices, the location and signs detected during patrol was recorded. In the case of illegal hunting activities, these were categorized according to those offences which directly relate to arrest of poachers, confiscation of firearms, spent cartridges found, gunshots heard, poacher's camps found, animals found killed, and wire snares recovered. Data collection is ongoing and outputs and analysis are still being worked upon.

PHOTO SPEAK

Rangers on field patrol





Elephant trail within project area



2.2.9 Works on production of documentary on elephant conservation

Elephant conservation project activities in Nigeria as supported by the Rufford Foundation were put together in form of a documentary. The documentary is titled, *In the footprints of a megaherbivore...the Elephants of Nigeria*. This was to showcase the efforts and contributions of the project leader through the Rufford Foundation at ensuring the protection of elephants and other wildlife species in the country. It was also aimed at calling the attention of stakeholders, particularly the government towards muscling up the right political will at protecting biodiversity species in the country. Some of the features of the documentary include scripting, field visit, filming, interviews and editing among others. The link to the documentary is: https://drive.google.com/drive/folders/1rYWvuZSABn-iCckqHexrYwz_6kLPoDBv.

PHOTO SPEAK

Interviews and Filming for documentary on elephant conservation





3. Project Achievements

Some of the practical conservation outputs of this work include the following:

- i. Securing and maintaining the habitat of forest elephant including their migratory corridors within the project area;
- ii. Consolidating the education and awareness raising programme on elephant conservation and management among key stakeholders including policy makers, local communities and other interest groups in the project area;
- iii. Contributing to capacity building of rangers involved in elephant monitoring through training sessions on monitoring and prevention of illegal activities in elephant sanctuary and adjoining areas;
- iv. Payment of stipends and allowances to bolster the morale and motivation of rangers in frontline of conservation activities in the project area;
- v. Procurement of equipment and facilities for establishing monitoring systems for protection of elephants within the project area;
- vi. Enhanced patrol activities and establishment of monitoring systems for protection of elephants within the project area;
- vii. Production of a documentary for education and awareness raising programme on elephant conservation and management among key

stakeholders including policy makers, local communities and other interest groups;

- viii. Production of sensitization materials such as fliers and handbills on elephant conservation;
- ix. Significant increase in visitation by tourists, researchers and students into the elephant sanctuary owing to increased level of protection and the generally enhanced integrity of biodiversity in the area; and
- x. Use of GeoTracker and Kobo Collect in Monitoring Rangers Patrol Efforts and Illegal Activities in Elephant Sanctuary of Omo Forest Reserve, Southwest Nigeria, by: Amusa, T.O., Azeek, K.K. and Olabode, E.A. (In Press).

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NewsFeed

1. <https://phenomenal.com.ng/headlines/conservation-experts-task-ogun-community-on-elephant-protection-many-trees-depend-on-the-elephants-digestive-system-for-their-seeds-to-be-effectively-propagated-and-if-elephants-become-extinct-s/>
2. <https://wuzupnigeria.com/conservation-experts-task-ogun-community-on-elephant-protection/>
3. <https://conservationsng.com/conservation-experts-task-ogun-community-on-elephant-protection/>
4. <https://www.instagram.com/p/B5JIHydnCih/>
5. <https://earthoptimismnairobi.org/themes/#>