

School of Biological Sciences  
College of Science

# Nigerian Montane Forest Project

*Annual Report*



09



# Introduction



2009 has been a very eventful year for the NMFP. Several new students from both Nigeria and overseas have begun research projects based around Ngel Nyaki forest, and other students have completed. Two new field assistants have been employed, and others have undergone training in their specialised areas.

Highlights include the installation of a high tech weather station at Ngel Nyaki, the Government Commissioning of the Yelwa Nursery School, and a visit by Dr David Blackburn, a herpetologist from Kansas State University Natural History Museum.

Having satellite internet at the field station is hugely significant. It allows regular communication between the Director and both field station staff and students. This has made management from New Zealand much more effective. The ability for students to keep in close touch with academic supervisors and family and friends is invaluable.

However, not so good, is the protection of Ngel Nyaki forest. Despite our patrollers working well, hunting is still rife and the forest continues to be threatened by burning and grazing by the Fulani pastoralists. The patrollers recently caught two hunters with dead three putty nose monkeys. Snares with dead duiker and other small mammals are relatively common. However the Governor of Taraba State, Danbaba Suntai, is taking action and has formed a task force to investigate the situation at Ngel Nyaki and in the other Donga Valley forests. The aim of the task force is to suggest measures for the more effective protection of the forests. It seems that the NMFP will play a key role in this – the Project will work with the Taraba State Forest Service in the administration of new Governmental funds for patrolling and implementing the Law.

Primatologist Prof. Janette Wallis is leaving the Nigerian American University in Yola. Janette will be missed by us all, but she will continue to be involved with student projects at Ngel Nyaki. Moreover as we are now looking after her three tanzanus- Jack, Audrey and baby Savannah, she is guaranteed to be back.

A special thanks to the VC of Gombe State University, Professor Abdullahi Mahadi for the logistical support he provides in the safe transportation of students from Abuja to Ngel Nyaki. Also to Matt Walters for the production of the annual report and our NMFP calendars.

Also thank you to everyone who has contributed to the Project during 2009. It is because to these contributions- financial, logistical and scientific, that we are able to operate.

## **Dr Hazel Chapman**

*Director*

*Nigerian Montane Forest Project*

Cover Photo: *Delyse Campbell overseeing the planting of tree seedlings into a fenced-off area. Six species have been planted, 3 from the nursery and 3 collected directly from the forest floor.*



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# Nigerian Montane Forest Project

## Mission Statement

*To promote national and international commitment to the conservation of Nigeria's montane forests by inspiring excellence in research by postgraduate students and empowering local communities through employment and education.*

## Aims

1. To combine scientific research with education at both tertiary and local community level in order to develop long term sustainable management of Nigeria's montane forests.
2. To facilitate the involvement of national and international researchers in Nigerian montane forest research
3. To involve the community in the management of montane forest ecosystems
4. To work with the community in other ways, such as developing small businesses and working with schools to develop conservation awareness.



*Steve George from the Geography Department UC, showing field assistants how to download the data from the new weather station.*

# Partners and Sponsors

## Project Partners

Aplori A. P. Leventis Ornithological Institute, Jos  
Federal University of Technology, Yola  
Gombe State University  
Nigerian Conservation Foundation  
Nigerian National Parks  
Taraba State Forestry  
University of Canterbury, NZ  
University of Kansas Natural History Museum

## Major Sponsors

Nexen Nigeria  
A. P. Leventis Foundation  
North of England Zoological Society  
DHL Nigeria



*The Commissioning of the ExxonMobil funded Yelwa Nursery School, April 17th 2009. The NMFP acted for ExxonMobil in the managing of the funds for the school and overseeing its building.*

# People

As always it is the unflinching dedication and enthusiasm of the field assistants and other staff of the NMFP which make the Project such a success. As well as working hard in the field, the staff invariably make students and visitors feel more than welcome and go out of their way to ensure that everyone is well catered for. This year we have employed one new field assistant, Sulaiman A. Idi. Suliman is from a local Fulani family.

There have been many visitors to the field station over the past year, including: Bubajoda Mafindi, the Executive Chairman of Basic Education for Taraba State; Prof Michel Noku, the VC of the new Taraba State University; Mrs Susan Eshett, Exxonmobil External Affairs Manager.

The Taraba State Task Force for Forest Conservation visited in November 2009. The group comprised Danjuma Audu, John Tiloni, Chefang, Adamu Abubakar, Tanko Blomosco and Hazechial Jalingo.

The Yelwa Football Team, The Yelwa Womans Group, The Yelwa Elders, The Yelwa Youth Group and the Yelwa Secondary School all visited the field station in November 2009 to support the NMFP in its interviews by Journalist Augustine Osayande, from THIS DAY national newspaper.

Prof Janette Wallis along with Ales Psaker and Betsy Espe, all from American Nigerian University, Yola, visited to deliver three tanzania monkeys. The tanzania trio have arrived from Yola, where Janette Wallis looked after them for over three years. The plan is attempt a 'soft' release, whereby the local Ngel Nyaki tanzania will become sufficiently used to the new arrivals that they will tolerate their release into the forest.



Hazel with some of the university students carrying out projects at Ngel Nyaki. (Photo: Usman Abubaker)



Yelwa Youth group.



Taraba State Task Force for Forest Conservation.



Yelwa Village Elders.



Yelwa Football Team.



Yelwa Secondary School. (Photo: Usman Abubaker)



Jack, Audrey and baby Savannah, now relocated at Ngel Nyaki. (Photo: Janette Wallis)



Misa Zubairu, Peyman Zawar-Reza, Danladi Umar, Jon Harding (behind), Steve George. Peyman and Steve were visiting the NMFP to set up the weather station and Jon Harding was at Ngel Nyaki to supervise Danladi Umar in his fresh water ecology PhD project.



Bubajoda Mafindi, Executive Chairman of the Basic Education Board, Commissioning the school on behalf of the State Governor, Danbaba Suntai. (Photo: Usman Abubaker)



# News

## Scholarships/Fellowships/Grants/ Jobs

**Fiona Agmen** has been awarded a PhD scholarship to continue her work on primatology. Fiona will work with Professor Colin Groves at ANU (Australian National University) Canberra.

**Ralph Adewoye** has been awarded a PhD scholarship from the National Agency for Space Research and Development and the Nigerian Forest Research Institute to work on remote sensing and GIS applications towards understanding the biodiversity of Nigeria's montane forest fragments.

**Samuel Temidayo (Dayo) Osinubi** has been awarded an IFS grant towards his PhD research on habitat choice and evolutionary fitness in the yellow breasted boubou *Laniarius atrolavus*.

**Aliyu Babale**, a lecturer in botany at Gombe State University has been awarded a Nigerian University Grant to enrol at the UC for his PhD in 'The fate of large seed in an Afromontane Forest'

**Charles Ensor** has been offered a position as Lecturer in biology at Gombe State University. In this new position he is being supported in his aim of enrolling at UC and completing his PhD research on "The relative importance of birds and insects as pollinators of a west african montane forest: a case study of Ngel-Nyaki forest reserve".

**Christy Udy** was awarded a UC summer scholarship to study Dung beetle taxonomy, ecology and foraging behaviour.

## Training Course

This year Augustine Ntim began his year's course in forest silviculture at Jalingo College of Forestry and Agriculture. Augustine will use his new knowledge in running the NMFP nursery for forest restoration.

## Conservation Club

2009 saw the NMFP Conservation Club grow considerably. We employed Markson Markus (who has worked with the NMFP for many years) to run the club, and he made visits to schools and villages on a monthly basis.

We now have seven schools/ communities registered in the club : Maisamari, Ngarogi, Gembu, Dujere, Mayo-Nyebbe, Zango and Yelwa village. We have 412 student members. These are from the Government Day

Secondary school in Maisamari (51 students), the University of Akure (16 students), Gombe State University (39 studenst) and the Alpha Community Service Secondary School in Yelwa (53 students). All students have gone on field trips in Ngel Nyaki Forest and listened to lectures about the work of the NMFP.

## Collaboration with the National Agency for Space Research and Development (NASRDA)

The relationship between NASRDA and the NMFP has developed over the past year. , We are working together to create a team of researchers to work on the biodiversity of Nigerias montane forests using GIS technology. We anticipate that two PhD students, including Ralph Adewoye, and two MSc students will be involved in the Project, as well as other researchers from UC.

## Patrolling and Conservation

We are hopeful that something EFFECTIVE is emerging as regards the conservation of Ngel Nyaki Forest and the neighboring forests in the Donga Valley. To this end The Governor of Taraba State, His Excellency Danbaba Suntai has set up a task force to report on the state of these forests. The task force is led by the ex Director of Forestry, Taraba State, Danjuma Audu and includes four other knowledgeable forest officers. The task force is working in collaboration with the State Justice Department and the police.

The group are visiting all the local forests, but with most emphasis set on Ngel Nyaki. Levels of hunting, grazing and slash and burn are

being recorded. The idea of a mobile court is being mooted.

The task force visited Ngel Nyaki on the 5th of November to discuss the situation here. In response the NMFP wrote a report in collaboration with the Taraba State Site Officer, Joseph Sankun. The report outlines the high levels of hunting, grazing and burning which are still being carried out in the Reserve, despite current efforts by NCF and NMFP.

Already the Governor has stated his intent to support a large proposal to employ over 50 new patrollers for the area- as an ongoing concern. The idea is that this funding will be administered through the NMFP. We are currently in negotiation of the details.

## Nursery School Commissioning

*April 17th 2009 was a big day for Yelwa village and the NMFP.*

*Below is an account of the day from: <http://allafrica.com/stories/200904220073.html>*

Esso Exploration and Production Nigeria Limited (EEPNL), a subsidiary of ExxonMobil Nigeria, in collaboration with the Nigerian Montane Forest Project, established a nursery school in Yelwa community, Sardauna Local Government Area, Taraba State. Uchechukwu Nnaike, who witnessed the hand-over ceremony, reports.

For the people of Yelwa village, Friday, April 17 would remain a memorable day, as they all waited eagerly for the formal hand-over of the first nursery school in the community to the state government. The children were not left out, as they, despite the scorching sun, all assembled in an orderly manner to witness the occasion.



*The new school buildings.*

The N5 million school project, which was funded by Mobil was built to provide education to 300 children in Yelwa community, and to prepare them for primary education.

Before the school was established, children who are too young to get into the only primary school in the community, used to accompany their parents to the farm. However, these children will now spend their time learning.

The school, which was at the instance of the Director of the Nigerian Montane Forest Project, Dr. Hazel Chapman consists of a block of four classrooms and another block of three offices, which are furnished and with running water from a borehole.

According to Hazel, the ruler of Yelwa community, Alhaji Ahmadu and a colleague, late Jauro Petel spoke to her about the need for a nursery school four years ago. She said the opportunity of getting sponsorship came when Mr. Robert Warren of Esso Exploration and Production Nigeria Limited (EEPNL), visited the forest. "Robert subsequently worked very hard with Susan Eshett to make this dream come true."

The school, she said was under the jurisdiction of the Montane Forest Project, but that it was managed and equipped by the State Education Board. "Between the Board and the Project, we have developed a vision whereby, before too long, the school will be totally administered by the state. We have plans to develop and grow the school."

She said Yelwa had the school only because it had the forest. "Without the forest, Robert Warren would never have visited Mambilla and there would be no Montane Forest Project. Yelwa is known internationally all because of Ngel Nyaki Forest."

According to her, the forest would play a major part in the future of the community through employment in research associated jobs and ecotourism and urged them to treat the forest with respect.

A representative of Mobil, Manager, Security Operations, Mr. Naphtali Jalani, said the project was built on the company's long standing support for education to which it makes strategic contribution in communities and countries where it has significant presence.

The company, he said had worked with non governmental organisations in the past and was proud to be associated with the Montane Forest Project, which showed due diligence to the funds provided to it for the school project.



Dr Hazel Chapman with Mobil, Manager, Security Operations, Mr Naphtali Jalani. (Photo: Usman Abubaker)

"We are particularly pleased to identify with the Taraba State government, the Montane Forest Project, and Yelwa community in their quest to provide a conducive learning environment for the children of the community. We congratulate all stakeholders for the completion of the school and urge the community to make good use of this unique opportunity."

Governor of Taraba state, Danbaba Suntai commended the company for embarking on education-based project. "Education should be a priority because it provides people with the most important tool to succeed in life."

Chairman of the State Universal Basic Education Board (SUBEB), Mr Bubajoda Mafindi Suntai, represented by the Chairman of the State Universal Basic Education Board (SUBEB), Mr. Bubajoda Mafindi, said the project was God-sent since it was a way of reaching out to the less privilege in the society.

Mafindi said SUBEB was worried that 5,000 children were still out of school in the state. "The situation is alarming and unacceptable and the implication is that the state may not attain the Education for All (EFA) goal by 2015."

He commended the partnership with companies like Esso and the Montane Project and other NGOs and international organisations that share the state's effort towards attaining the EFA goal.

He promised to maintain the school and to post qualified teachers there and pleaded with stakeholders in the community to make land available and to ensure that there was no encroachment on the school land.

He commended the Montane Project for its commitment not only to the education of the children but also for the development of Yelwa community.

## Collaboration with University of Kansas Natural History Museum

In April 2009 Dr David Blackburn from the University of Kansas Natural History Museum visited the NMFP and Ngel Nyaki to make a preliminary investigation of the frogs and reptiles in the area. Dr Blackburn was a wonderful visitor. He came laden with books about frogs and reptiles for the NMFP library, and taught the field assistants how to photograph and catch frogs. Everyone learned something about the fascinating herpetological diversity at Ngel Nyaki. Thank you David.

The NMFP, Gombe State University and the University of Kansas Natural History Museum have signed an MOU and plan to work together more in the future.

Below is an article David wrote about his visit on Project Frog <http://www.projectexploration.org/projectfrog/fu-72709.html>

### Nigeria Field Update 1

April 2009

After more than 24 hours of flights and waiting at airports, I arrived in Abuja, the capital of Nigeria. Ralph Adewoye, a beginning PhD student working with the Nigerian Montane Forest Project (NMFP), met me at the airport. The following morning, Ralph and I hired a taxi from the Abuja "motorpark" that got us on the way to the Mambilla Plateau. We rode for about 8 hours then got a new taxi and went another 3 hours before stopping for the night—yes, that is 11 hours in a taxi. The next morning, we got up early, rode for about another hour or so in a taxi before arriving in Yelwa; we then took an easy hike for about 40 minutes and arrived at the NMFP field station before 9 am. All in all, the trip up the Mambilla Plateau to Yelwa was very easy. It's paved roads all the way, and we had an easy time with taxis and travel. This was not always the case in Cameroon, so I was really pleased.

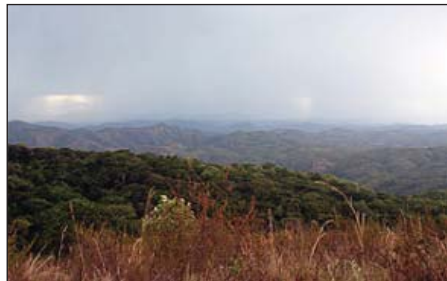


A new species of *Arthroleptis*, the group of frogs that is the focus of much of Dave's research. (Photo: David Blackburn)

The Mambilla Plateau is in Taraba State, which is located on the far eastern edge of Nigeria. Some parts of Taraba State are at low elevations, but the state capital, Gombe, is located up on the plateau about an hour drive from the NMFP field station. Most of the plateau is covered in open grasslands that are used for grazing and farming by local residents. In the valleys of these grasslands, there are small forests along the streams; this type of forest is called a “riparian forest.” When you look at this landscape from far away, it looks like a patchwork of grasslands with little fingers of riparian forests wiggling their ways through the small valleys. On the western edge of the plateau, as well as in a few other areas, there are some patches of real montane forests (“mountain forests”). One of these patches, the Ngel Nyaki (“En-ghel-n-yah-key”) Forest Reserve, is less than 10 square kilometers but has one of the most diverse assemblages of plants anywhere in Nigeria. Next to the Ngel Nyaki is the small NMFP field station. Professor Hazel Chapman, a botanist from the University of Canterbury, started the field station with the goal of preserving this important forest. Hazel’s father (now in his 90’s) is also a botanist, and together he and Hazel recently published the most comprehensive survey of the plants of this part of Nigeria.

I visited the NMFP field station in early-to-mid April, which is the tail-end of the dry season. The main goal of this visit was to check out the field station, meet Hazel and others associated with NMFP and Gombe State University, and to make the very first surveys of frogs in and around Ngel Nyaki. In short, it was a very successful trip, and it was a lot of fun to see this excellent little field station and to make contact with new colleagues from both New Zealand and Nigeria.

Because the real rainy season hadn’t arrived yet, I don’t think I caught the full diversity of frogs at Ngel Nyaki. In some cases, I was only able to catch the tadpoles of particular species; I’ll have to return during the real rainy season to catch the adults of the same species. But it’s important to note that even just the tadpoles can give us a first peak into the diversity of frogs present in the forest. During previous work in Cameroon in 2006, I collected lots of adult frogs and tadpoles and, working with an undergrad in the lab at Harvard, I was able to get DNA data from both. This let me identify many of the tadpoles. This is important, because without these data is difficult to tell whether a particular tadpole and an adult are actually the same species.



Looking westwards over the forests of the Ngel Nyaki Forest Reserve towards a rainstorm. (Photo: David Blackburn)



The Nigerian Montane Forest Project field station overlooking the eastern edge of the Ngel Nyaki Forest Reserve. (Photo: David Blackburn)

Now, since I know what these tadpoles look like, I can at least do a preliminary identification of some of the tadpoles at Ngel Nyaki. Beginning in the summer of 2009, I will also get DNA data from these new tadpoles from Nigeria. As we combined this data with the data from Cameroon, we can begin to get a picture of what species might be present at Ngel Nyaki.

That said, I still was able to catch some neat frogs, including at least one of which seems to be a new species. Because I’ve become familiar with the frog species found in the mountains in neighbouring Cameroon, I’m fairly confident that something is a new species when I find it while I’m out in the field. However, scientists cannot publish claims based only on their hunches. To demonstrate that this is a new species to other researchers, I will do further research using comparative anatomy, DNA analysis, and other tools. I recorded a number of species from either the forest or the surrounding grassland and riparian forests. It is important to note that all of these records are important to our understanding of this part of Nigeria. Very little work had been done here previously; in fact, we only knew about two species of frogs recorded from the plateau near Ngel Nyaki, and both were grassland species.

The forests of Ngel Nyaki are special because they have some interesting and charismatic

“mega-fauna” (large animals—at least bigger than frogs!), including chimpanzees and turacos (a type of medium-to-large tropical bird). The chimpanzees that occur in Ngel Nyaki and the neighbouring Kurmi Danko forest are special because they are one of very few populations of the endangered Nigerian Chimpanzee (*Pan troglodytes vellerosus*; note that there has been a recent move to call this *P. t. ellioti* instead).

Ngel Nyaki is an ideal place to return for field study and more detailed surveys. I am keen to use the NMFP field station as a resource for students interested in understanding the ecology and natural history of some of the many odd species of frogs found in this part of Africa. There is a lot of work still to do.

I was fortunate to be able to attend what might be one of NMFP’s biggest achievements: the opening of a new nursery school in the village of Yelwa. This was funded through a collaboration with ExxonMobil (i.e., ESSO). There were hundreds of children and people from the village in addition to lots of people involved with education and local government in Taraba State. There was even dancing and music!

While I was at Ngel Nyaki, there was truly an “international” feel to this small field station. In addition to myself, there were several visiting researchers (including Hazel) from



The main road through Yelwa village and signs for the new nursery school and the Nigerian Montane Forest Project. (Photo: David Blackburn)



A team of Gombe State University students and GSU and University of Canterbury researchers heads out for a morning of stream surveys. (Photo: David Blackburn)

New Zealand, lecturers from Nigeria's Gombe State University (who are also current or beginning PhD students at the University of Canterbury in New Zealand), undergraduate BSc students from Gombe State University, and a team of local field assistants from Yelwa village. The field station has a number of bedrooms, a herbaria (a "library" of plant samples), and a small library with several computers run off of a generator. The field station has a very nice veranda that overlooks the edge of Ngel Nyaki forest, which allows for good view of monkeys and birds in the treetops and storms rolling onto the plateau. My visit to the field station was a fabulous opportunity to meet local students and researchers and do some work with them in the forests.

Importantly, funding from Project Exploration enabled me to contribute some additional important resources to the NMFP library.

## Weather Station

In April Dr Peyman Zawar-Reza and Dr Steve George, from UC, visited the NMFP to set up the new weather station. Unfortunately there were logistical problems, and so Steve returned in November to complete the job. Below is a copy of the report to the British High Commission, who funded the weather station, along with DHL Nigeria who sponsored all the transport costs:

**The Influence of Land Use Change on Local and Regional Climate in North East Nigeria.**

*Report from the Nigerian Montane Forest Project To the British High Commission Abuja for the Tactical Fund, December 2009*

The Nigerian Montane Forest Project (NMFP) received a grant of £14,000 from the BHC, Abuja to install one permanent and two small transportable, weather stations on Mambilla Plateau, NE Nigeria.

The NMFP wish to thank the BHC for providing the grant and also for all the help they have given the project in terms of administration and logistics. This support has been outstanding.

The main weather station consists of multiple sensors connected to a Campbell datalogger (which has onboard storage equivalent to ~10yrs of data). The system is independent in that it is powered by a gel-battery/solar panel combination (thus, minimum upkeep required). The instruments are a Vaisala

unit which combines measurements of air temperature, relative humidity (RH), wind (speed and direction), precipitation and pressure. In the photos, this is the white unit at the top of the pole (the white enclosure being a shield against direct radiation). In addition, mounted on the horizontal arm are solar radiation and PAR (photosynthetically active radiation) sensors. Below ground are ground temperature and soil moisture sensors.

The mobile HOBO units measure windspeed/direction, PAR, temperature, RH, precipitation, soil moisture and soil temperature. They have a data logger, and are powered by standard AA batteries.

Data is collected and logged every 10 minutes. It is downloaded onto a laptop weekly and the data sent back to the University of Canterbury (UC) NZ. Local field assistants from the NMFP have been trained to download the data and maintain the instruments.

At UC Dr's Peyman Zawar-Reza and Steve George are developing a web site which will be dedicated to the Ngel Nyaki weather data. All data will be presented on the website in monthly averages, and will be freely available to anyone who is interested.

In addition the data will be analysed and interpreted by a Nigerian PhD student supervised by Dr's Zawar-Reza and George at UC. We have a candidate in mind, a young lecturer from Gombe State University.

This is the only data of its kind coming out of the West African highlands, and so will be of immense value both locally and internationally, especially in terms of climate and land use change.

To advertise the project, the NMFP invited Augustine Osayande, a journalist from This Day, to visit Ngel Nyaki and write an article on the weather station. He has done so and it is available on: <http://allafrica.com/stories/200911090543.html>



Steve George calibrating a Hobo in the forest.



The two portable Hobo weather stations, which will be used in different projects to collect data.

# Forest Restoration



Firstly, Augustine Ntim has temporarily left the NMFP to attend a year long course in silviculture and nursery management at Jalingo College of Forestry and Agriculture.

Fencing off of grazed grassland, planting of trees grown in our nursery into these areas and research into the most effective management of fenced off areas has continued to play a major role in the NMFP research agenda in 2009.

As well as Delyse Campbell's MSc research (see right) we have established a large experiment to investigate the best way to manage fenced off areas for forest restoration. Simply removing cattle and preventing burning does not always lead to forest establishment because of strong competition from grasses.

The experiment has five sites (fenced off areas next to the forest, with no grazing or burning), and four treatments within each site; a) light burn, b) scattered seed onto light burn, c) scattered seed only (no burn) and d) a perch. There are 30 reps per treatment.

The experiment was set up in December 2009 and will be monitored regularly for tree seedling growth and establishment.

*Contrast between the fenced-off, ungrazed and unburnt grassland and the normal overgrazed plateau. We are introducing different treatments into the fenced off area to encourage tree regeneration.*



*Delyse Campbell overseeing the planting of tree seedlings into a fenced-off area. Six species have been planted, 3 from the nursery and 3 collected directly from the forest floor.*

# UC Student Projects

**Aliyu, Babale** The fate of large seed in an Afromontane forest with few wide gaped frugivores. PhD.

**Adewoye, Ralph** Remote sensing and geographical information system application to biodiversity assessments of Nigeria's montane forest fragments. PhD.

**Azizan, Tengku Rinalfi Putra Ibn Tengku** The role of putty nose monkeys (*Cercopithecus nicitans*) in forest restoration. PhD.

**Barnes, Andrew** Forest edges, livestock encroachment, and boundary fencing: The effects of habitat edges on dung beetle (Coleoptera: Scarabaeidae) community structure and function. MSc.

**Campbell, Delyse** The potential for natural seed dispersal in the restoration of West African montane forest. MSc.

**Dutton, Paul** Foraging behaviour of the Nigerian/Cameroon chimpanzee (*Pan troglodytes ellioti*) in a small remnant of montane forest: assessment of technology, diet and habitat. PhD.

**Grassham, Abby** Relationships between the tantalus monkey and forest structure in a West African montane forest. MSc

**Korndoerfer, Martin** Fulani pastoral practices around the Ngel Nyaki Forest Reserve. MSc.

**Nsor, Charles Ayuk** The relative importance of birds and insects as pollinators of a west african montane forest: a case study of Ngel Nyaki forest reserve. PhD (enrolment pending).

**Osinubi, Samuel (Dayo) Temidayo** Habitat choice and evolutionary fitness in the yellow breasted boubou (*Laniarius atrofloavus*). PhD.

**Udy, Christy** Dung beetle taxonomy, ecology and foraging behaviour. Student volunteer.

**Umar, Danladi Mohammed** How do varying land-uses affect stream communities in highland tropical streams in Nigeria? PhD.

## Postdoctoral Research

**Kennedy Poloma** A preliminary pollinator web in a West African montane forest.

## Completed Theses

**Agmen, Fiona** Tantalus monkeys *Chlorocebus tantalus* and seed dispersal. BSc(Hons).

**Korndoerfer, Tammy** Natural Resource use and Livelihoods of Villagers on the Mambilla Plateau, Nigeria: Yelwa Village as a case study MSc.

**Weston, Kerry-Anne** The role of sunbirds in pollination at Ngel Nyaki forest. MSc.

## Students Visitors from other Universities

**Asory, Priscilla** from FUTY spent a week at Ngel Nyaki working on her MSC project to do with forest soils.

## Industrial Training (IT) students

This year the NMFP hosted four IT students from Gombe State University:

**Yohana Doronge** BSc Botany

**Gayus Yila** BSc Botany

**Lamogo Yohanna** BSc Zoology

**Billah Cleophas** Ajiya BSc Botany

Also one IT student was hosted from the American Nigerian University (ANU), Yola:

**Nacha Geoffrey**

The students were based at the NMFP field station for six months (April – September 09). During this period they worked along-side postgraduate students and field assistants to gain experience in a range of ecological/botanical techniques.



Abby Grassham and Musa watching tantalus. Inset: A tantalus monkey. (Photo: Matt Walters)

## Academic Supervisors:

Assoc Prof Jim Briskie (UC) Biology

Assoc Prof Jenny Brown (UC) Math and Statistics

Dr Hazel Chapman (UC) Evolutionary Ecology

Dr Raphael Didham (UC) Ecology

Dr Jon Harding (UC) Fresh water ecology

Prof Dave Kelly (UC) Plant Ecology

Assoc Prof David Norton (UC) Forestry

Dr Ulf Ottoson (Leventis Conservation Institute, Apori) Ornithology

Prof Janet Wallis (American Nigerian University, Yola) Primatology

Dr Britta Kunz University of Wüerzburg (Germany) Primatology



Andrew Barnes and Idris checking a dung pile to record the rate at which dung is removed by dung beetles, at different distances from the forest edge.



Dayo Osinubi (top) checking out his radio telemetry equipment. Above, a yellow breasted boubou (*Laniarius atroflavus*), the species on which Dayo is working. (Photo: Dayo Osinubi)



Delyse Campbell looking for seedlings of *Santiria trimera* for her forest restoration project.



Paul Dutton counting chimp nests in Kurmin Danko.

# Outputs

## Spoken papers

- Temidayo Osinubi, Hazel Chapman, James Briskie, Ulf Ottosson and Jennifer Brown. (October 2009) **Behaviour as an indicator of habitat quality: case study of an Afro-montane forest resident bird species.** The 10th International Congress of Ecology, INTECOL Brisbane, Australia.
- Yoriyo K P and Chapman H M (October 09) **Insect pollinators of a West African Montane Forest.** Nigerian Entomological Society Conference. ABU Zaria.
- Weston, KA, Kelly, D and Chapman HM (February 09) **Mistletoe mutualisms in a West African Montane Forest.** Darwins 200th birthday symposium, University of Auckland, New Zealand.
- Martin Korndorfer (2009) **Fulani pastoral practices around the Ngel Nyaki Forest Reserve.** Public Talk, Christchurch, New Zealand.

## Poster

Western, K. Chapman, H.M. Kelly, D. (2009) **Mistletoe mutualisms in a West African montane forest.**

## Papers

- Fiona, L. A., M. C. Hazel, et al. (2009). Seed dispersal by tanzalus monkeys *Chlorocebus tantalus tantalus* in a Nigerian montane forest. **African Journal of Ecology** On Line First.
- Mattheas A, Chapman HM and Kelly D (2010) Testing for Janzen – Connell effects in a West African Montane Forest In Press **Biotropica**
- Chapman, H.M., S.L. Goldson, J.Bek Post-dispersal Seed Removal and Seed Germination of *Cercopithecus nictitans* Dispersed Seed. **Folia Primatologica** Accepted pending minor revision
- J. O. Ihuma, H. M. Chapman, T. Iyiola, J.A. Brown, C. Akosim. Why small, degraded riparian fragments need protection: their function in maintaining the diversity of Nigerian montane forest communities. Submitted Dec 09 **Tropical Conservation Science.**
- Blackburn D A new puddle frog (Phrynobatrachidae: Phrynobatrachus) from the Mambilla Plateau in eastern Nigeria **African Journal of Herpetology** Submitted November 09.

## Newspaper Articles

<http://allafrica.com/stories/200911090543.html>.

- THIS DAY 21 April 2009 **Mobil Builds Nursery School for Community**  
Esso Exploration and Production Nigeria Limited (EEPNL), a subsidiary of ExxonMobil Nigeria, in collaboration with the Nigerian Montane Forest Project, established a nursery school in Yelwa community, Sardauna Local Government Area, Taraba State. Uchechukwu Nnaike, who witnessed the hand-over ceremony, reports...
- THIS DAY 9 Nov 2009 **British Embassy Constructs Weather Station**  
The British High Commission in Nigeria through the European Union 'Low Carbon High Growth Strategic Programme Fund' has funded the construction of automated weather station for the Nigerian Montane Forest Project base in Mambilla Plateau, Taraba State under the Directorship of Dr Hazel Chapman from the University of Canterbury, New Zealand.....
- THIS DAY 12 Nov 2009 **Forest Reserve - Women Seek Govt Attention**  
Women from Yelwa community of Mambilla Plateau in Sarduna Local Government of Taraba state have called on the Federal and State Governments to give necessary attention to the Ngel-Nyaki forest reserve.....

- THIS DAY 17 Nov 2009 **Developing a Community Through Forest Preservation**  
As most forest reserves in the country continue to disappear, Augustine Osayande who was in Mambilla plateau recently writes on the effort to bring back the Ngel-Nyaki montane forest to its natural form, which is also beneficial to the host community.

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Tuesday, November 17, 2009

# Features

FEATURES EDITOR: ROLAND OGBONNAYA

## Developing a Community through Forest Preservation

As most forest reserves in the country continue to disappear, Augustine Osayande who was in Mambilla plateau recently writes on the effort to bring back the Ngel-Nyaki montane forest to its natural form, which is also beneficial to the host community

Many people are certainly not aware of the existence of Ngel-Nyaki montane forest reserve of Mambilla plateau. The 40km-square forest is located within Yelwa, Doguwa and Nkoro-Nkoro Nigerian communities of the Mambilla plateau in Sarkana local government area of Taraba State. Due to overgrazing and other human interference, the good forest area is now about 7.2km square.

Effort to protect the forest and its valuable animals got a boost in 2003, when a senior lecturer from the University of Canterbury, New Zealand, Dr Hazel Chapman checked to set-up a research centre at the forest in 2003. According to Chapman, the aim of the project was to investigate the effect of fragmentation and degradation of tree and tree seedling at the forest. Presently the centre has about eight postgraduate students conducting different research at them.

Speaking to THISDAY in an interview at the field station of the research centre, Chapman who is the director said the project has a long history. She said it began in 1976 when she was working with her family in the Mambilla plateau. She said her father did a lot of work on the montane forest and she always accompanied him on some of his trips. But in 2002, about 10 years later after assisting her father in writing his work for publication, develop interest for forest again.

Some years, she returned back to Nigeria with a group of people from University of Canterbury and went round the Mambilla montane forest and the gothic forest of Gashaka Gashem National park where her father had worked for several years. It was surprising how the forest had changed in the period of 30 years.

When we came to Ngel-Nyaki, I thought it would be a wonderful place to have a field station and do some research. This was because I am a biologist and the location was also close to the road. So I came in 2003 and I met Miss Zubairu and Augustine Johnson. The three of us have a vision to build a field station and a research site at the Ngel-Nyaki forest reserve. When we started the research, I brought two postgraduate students from Canterbury and we worked in the forest.

It was very difficult to do good job under such condition. In 2003 due to pressure from Miss, we got rescue from Nkechi Nigeria, a Canadian oil company for the construction of the field station and we started. It was not an easy job because the area is highly remote, but we completed the field station toward the end of 2003. The company has been a regular supporter of the project. We have also received support from North England Zoological Society in the area of research, DRI, in logistics and A.P. Leverts in patrolling.

Since 2005, the project has progressed since many students both from Nigeria and New Zealand joined us. We also have researchers from different institutions within Nigeria and abroad. Presently we have eight students in the research centre and 21 local people from the surrounding communities are working as field assistants at the centre. Chapman described Ngel-Nyaki as a beautiful forest. The forest is amazing, it is the only forest of its type and size left in the Mambilla plateau she said.

More endangered animal species in the forest now include the 7.2km square, which is the only existing good part of the forest. Zubairu, a field assistant at the centre told THISDAY that the Nigerian Cameroon chimpanzees, pygmy marmoset, buffalo and several tree species are in the forest. This, he said makes the forest still scientifically and internationally important. Chapman added that the forest is also very important to the plateau as it affect the local climate of the area.

The plateau is believed to be the coldest place in the country. The Mambilla montane forest reserve project is certainly the best way to understand and manage the Ngel-Nyaki forest and other forests in the area. Most of the local people believe that understanding the forest would really help in managing the forest properly. They said it can also generate employment for local people and would provide opportunity for the local people to know what is available in their forest.

Chapman confirmed to THISDAY that the local communities welcomed the project and has shown their support by providing logistics. She said the local workers employed as field assistants have been of great help to many researchers who have to visit the centre. This was confirmed by the Wakis of Yelwa, Mallam Abiraka Adams, who said the nursery, was constructed in the village through the project.

He said since the project started most part of the forest has been reserved back to the natural state. He said they would continue to work with Chapman to ensure that all parts of the forest reserve are protected for the future generation. He appealed to the state government to provide forest guard as soon as possible. The community women stepped it up by saying they are ready to carrying Chapman in their hand.

According to them, apart from providing the school, she also assisted in setting their basket in places like Lagos with better price. She has put their village on the world map. Even the youth have their own story to tell. According to their leader, Diallan Zubairu, Chapman works with everybody in the community, she provides help for the youths and in some cases she gives them assistance to ensure some projects.

We are asking government and other corporate organisations to support her work for the benefit of our community. The Taraba State government has also show their support for the project by assisting in the provision of computers, solar power system and fencing, even with the present of the field station inside, the forest is being threatened by illegal grazing.

Chapman explained that hermitism take their cattle for grazing inside the forest and in some cases set part of the forest ablaze. If enclosed higher authorities do not come in and help to control overgrazing, illegal poaching and hunting, the nice kind of protecting the forest might be a wasted effort. She appealed to the federal government, especially the Federal Ministry of Environment to recognise the importance of the forest and the project by providing forest patrol guards to ensure the future of the forest.

**Bonding with the community**





# Mistletoe mutualisms in a West African montane forest

Kerry Weston<sup>1</sup>, Hazel Chapman<sup>1,2</sup>, Dave Kelly<sup>2</sup>

<sup>1</sup> Director, Nigerian Montane Forest Project; Yelwa, Taraba State, Nigeria.

<sup>2</sup> School of Biological Sciences, University of Canterbury, New Zealand.

## Introduction

### Matchup, Mutualism and Coevolution:

Charles Darwin recognised the near perfect match between the morphology of some plants and their pollinators, believing any attempt to explain such matchup was futile if not in consideration of coadaptation between organic beings (Darwin 1859). These coadaptations provided a perfect model for evolutionary adaptation, illustrating how organisms can act as "selective agents" on each other, coevolving over time to produce the mutualisms ubiquitously observed throughout nature.

### Don't judge a flower by its colour?

Pressures of selection exerted by pollinators produce a suite of flower characteristics (colour, odour, nectar and morphology) commonly referred to as "pollination syndromes" (Fenster et al. 2004). In terms of evolution, the more effective the flower visitor is as a pollinator, the stronger its role as a selective agent. Some naturalists use this concept of floral syndromes to infer the pollinators of a plant in the absence of actual observation, a risky practice as most plants are actually pollinated by a wide range of taxa (Johnson and Steiner 2000).



Bird pollinated (ornithophilous) plants are typically brightly coloured (red, orange, yellow) and have odourless, large closed flowers with copious amounts of sugar-rich nectar.

### Mistletoes as a model for mutualism:

Mistletoes are a diverse group of parasitic flowering plants comprising over 1300 species distributed across a wide range of habitats worldwide. Most mistletoes; with the exception of members of the Viscaceae family, are pollinated primarily by birds and thus display the floral syndrome typically associated with ornithophilous pollination (Watson 2001).

I investigated pollination mutualisms in two West African mistletoe species in the family Loranthaceae - *Globimetula braunii* and *Agelanthus brunneus* in Ngel Nyaki Montane Forest Reserve, S.E. Nigeria.

### Project objectives:

1. Identify all flower visitors to individual mistletoe plants
2. Investigate the role of flower visitors in pollination
3. Evaluate the breeding system of each mistletoe species



## Results

Five sunbird and one honey bee species were observed visiting the mistletoes. Mean time spent by sunbirds per flower per hour was similar for *A. brunneus* (0.10 secs/flwr/hr) and *G. braunii* (0.11 secs/flwr/hr). The honeybees appeared to act only as nectar robbers on *A. brunneus*.

Species	<i>A. brunneus</i>	<i>G. braunii</i>
Western olive sunbird	✓	✓
Northern double-collared sunbird	✓	✓
Variable sunbird	✓	✓
Green-headed sunbird	✗	✓
Honey bees	✓	✗



Northern double-collared sunbird



Variable sunbird (Photo: Kyle Luman)

## Pollination mechanism of the study plants

### *Globimetula braunii*

The hermaphrodite flowers have an explosive, 2-stage opening mechanism:



The mature buds darken at their swollen tips signaling to the pollinators that they are ripe and contain nectar



The birds peck the tip causing the flower to open and the petals to recoil (1st stage)



This reveals small vents at the base of the petals, probing of which pulls the stamens away from the style and releases the pollen explosively (2nd stage)

### *Agelanthus brunneus*

The hermaphrodite flowers have an explosive, 1-stage opening mechanism considered to represent the pinnacle of mistletoe evolutionary development (Polhill and Weins, 1998):



Vents close to the tip of the mature bud open to form a "Chinese lantern" type structure.



Probing into the vents causes the flower petals to split apart at the position of beak insertion, pulling the stamens away from the style which releases the pollen explosively and pulls the stigma towards the pollinator.

Fig 1. Role of pollinators in flower opening

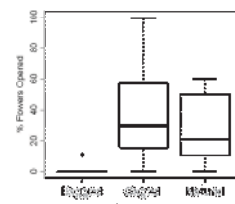


Fig 1a. *Agelanthus brunneus*. The bagged (no pollinators) treatment had significantly fewer flowers opened than caged (insects only) and natural (bird- and insect-accessible). (Binomial GLM;  $p < 0.001$ )  
**No Pollinators = no flower opening.**

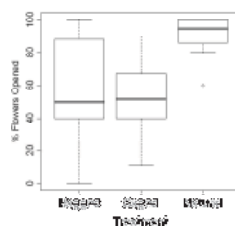


Fig 1b. *Globimetula braunii*. The natural (bird- and insect-accessible) treatment had significantly more flowers opened than the bagged (no pollinators) and caged (insects only). (Quasibinomial GLM;  $p < 0.001$ )  
**Sunbirds ↑ flower opening**

Fig 2. Role of pollinators in fruit set

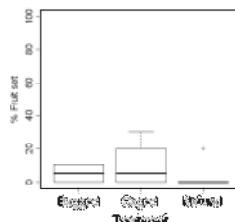


Fig 2a. *Agelanthus brunneus*. Treatment had no significant effect on fruit set. (Binomial GLM;  $p > 0.05$ )  
**Pollinators = no significant difference to fruit set**

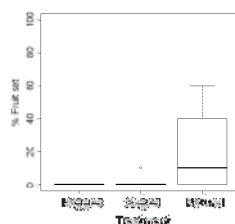


Fig 2b. *Globimetula braunii*. The natural (bird- and insect-accessible) treatment had significantly more fruit set than the bagged (no pollinators) and caged (insects only). (Binomial GLM;  $p < 0.001$ )  
**Sunbirds = fruit set**

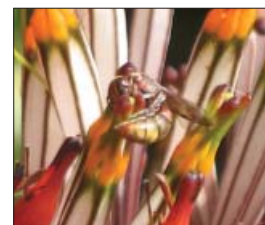
## Summary

Mistletoe	<i>G. braunii</i>	<i>A. brunneus</i>
Primary pollinators	Sunbirds	Sunbirds
Obligate flower opening	✗	✓
Dependent on primary pollinator for fruit set	✓	✗

*A. brunneus* has a relatively generalised pollination system and is able to produce fruits in the absence of pollinators; despite its lack of self-opening flowers. In contrast, the flowers of *G. braunii* are able to open themselves, but *G. braunii* appears entirely reliant on a specialised relationship with the sunbirds for fruit set.

## Work in Progress

Hand pollinations (crossed and selfed) are being carried out to a) test for self compatibility b) test whether plants are producing fewer fruits than they would if pollen supplemented, thereby indicating a shortage of effective pollinators or "pollen limitation" (Ashman et al. 2004). Research on a third mistletoe species - "*Agelanthus djurensis*" is also underway.



Vespid wasp (Subfamily Vespinae) opening a flower of *A. djurensis*.

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Poster design by Matt Walters

## Workshops

Hazel Chapman was invited to participate in a workshop held in Calabar October 2009 to discuss an Action Plan for the conservation of the Endangered Nigerian/Cameroun Chimpanzee.

The workshop was run by Beth Morgan, Head of Central African Programme, San Diego Zoo and Andrew Dunn of the Wildlife Conservation Society. Below is a summary written by Andrew Dunn:

A brief summary of the Nigeria-Cameroon Chimpanzee

Action Planning Workshop

Calabar, Nigeria

5th and 6th October 2009

**Day 1** opened with a welcoming speech from Andrew Dunn and Fidelis Omeni. The proceedings continued with a series of presentations outlining the aim of the workshop, and background information on the Nigeria-Cameroon chimpanzee (which is also available on [www.elliotti.org](http://www.elliotti.org)). After a coffee break, we worked together to identify all places on a map of Nigeria where we believe chimpanzees to be present. We added chimpanzee records which were missing from our original base maps. After lunch we discussed the threats to chimpanzees across their range and identified hunting and habitat destruction as two major, proximate threats. We then briefly discussed the identification of 'conservation units' for chimpanzees, and identified a number of such areas in Nigeria, before discussing our knowledge of the distribution and status of chimpanzee populations in each of these units in more detail (using a data table).

**Day 2** commenced with an extended discussion about the role and function of past action plans and how this action plan should be structured. It was agreed that this action plan might follow the structure used by the Cross River Gorilla action plan. We went on to discuss criteria that we might use in determining priority sites for chimpanzee conservation, given that resources are limited. We then went through our conservation units and gave each site within those populations an estimate of population size (<50, 50-220, 200-500, >500 animals) as well as noting how that estimate was arrived at (surveys or based on our field knowledge). We also ranked the three factors that lead to habitat destruction at each site – logging, farming and burning. We did not rank hunting since we decided it was severe throughout the range. We then went on to discuss priority areas for surveys across the chimpanzee range, before also contemplating priority sites for surveys, given that so many of the sites appear to have low chimpanzee populations and thus survey results are often inconclusive.

The site-specific actions suggested by participants was discussed after lunch, before an extended debate about regional actions which should be considered in order to increase the long term survival prospects of chimpanzees across Nigeria. During this session we covered topics as diverse as law enforcement, tourism, public awareness and research. The workshop was closed by Fidelis Omeni and Andrew Dunn, and a photograph was taken of the participants.



*A chimpanzee photographed in the Ngel Nyaki forest. (Photo: Tony Disley)*



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