

Biosearch Nyika

Scientific Exploration
of the
Nyika National Park and
Vwaza Marsh Game Reserve
Malawi,
Central Africa
2009

Edited by C. P. & M. J. Overton

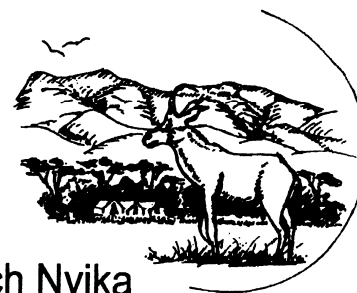
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Cover photographs;
Front - Sarah Fowkes at Chisanga Falls.
Back - Common Duiker fawn by Marianne Overton



Biosearch Nyika

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FOREWORD

C Peter Overton

It is both satisfying and humbling that Biosearch Nyika has now completed its fourteenth major exploration of some of the remotest regions of the Nyika National Park in northern Malawi. This lovely park has remained truly wild and unspoilt during the entire period that I have known it since 1972. The wilderness appeal prompted the writer, film maker and explorer Sir Lawrence van de Post to be patron to our project at its inception. Our expeditions now form the longest running scientific and international support project that the Nyika has experienced since it became Malawi's first national park in 1965. In fact one eminent botanist said to me recently that he thought this may be "one of the most researched areas in Central Africa"!

I think this is a slight exaggeration. Nyika remains quite inaccessible; it is in the north of the country and it takes effectively two days to get to the Park and two days to get back to Lilongwe. Apart from the Biosearch teams, the 2000 square kilometres plus of the 1978 extension to the original park have also remained virtually unvisited because it is perceived to be too much like hard work trekking through the tough terrain! This is largely perception rather than reality. It is hard work if you pay a visit of just a few days to the high altitude plateau but after a week or two of being out there you rapidly become acclimatised and fit and one step is no harder than its predecessor; it simply takes time. The elephants manage it and we try to emulate their mode of travel; slow and persistent. This is the key to our success; despite the modern trend towards fleeting visits to 'ecological sites', often sandwiched between flights to other interesting areas with more beer and nightlife, we have stuck to making each visit last a month. The reason can be summed up in a simple mathematical concept. In the first week we achieve 1x, in the second week 2x and in the third week 4x. We have time to live and breathe this wonderful wilderness and time to discover things that could easily pass us by if we were in a hurry.



The view out of the Park from Mwenembwe Forest clinging to the eastern escarpment

Tim Wayman

In 2009 our small team visited seven different areas, one of which was Mwenembwe Forest. Of all the areas near the top of the plateau this one seems to have received virtually no attention from the impressive list of botanical collectors that have visited the Nyika since the 19th century. It has long been our intention of spending time on the eastern escarpment and we did have a short foray in August 2006 but 2009 was to be the year for some extended work and fascinating exploration. We visited Juniper Forest for three days; this was our third

camp at this well known but remote outpost and the track remains difficult for any vehicle, especially without high suspension. Here we located a new site of historic iron ore smelting in one of the nearby forest patches. We spent some nights in a valley just below Kasaramba and found that poachers had not long left and clearly had intentions of returning shortly. On the escarpment below Kasaramba we found more snares set than we had experienced since the previous trip into the Sabi and Guwu northern valleys in 2003. This area is clearly being well 'worked over' from the village below and needs greater patrolling effort by the Park staff when resources become available.

The team finished their work for the second year running in the northern part of Vwaza Game Reserve. As described in our 2008 report, this area is very different in character to the Nyika and provides a good contrast for biological studies of all sorts. Our expedition story describes the problems of navigation on an essentially flat landscape with good tree cover; it is fortunate that our team was pretty fit by then since they managed a marathon of a day getting lost and re-finding themselves. The lesson, as always, was to use proper navigational aids rather than local knowledge, since ‘a slight detour’ to one of the local inhabitants is a major feat to a visitor.

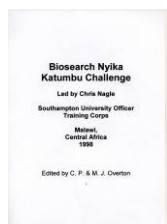
For those who have experienced the cold winter in much of the U.K. during 2009/10 it may be of interest to note that the Nyika also experienced a very cold winter last July and August. We have alluded to this in the report and are pleased that, despite this, Ray Murphy was able to join the team to extend his list of Nyika and Vwaza insects. The revised list, which we have published, is of major international significance and we are very pleased that insects are not always averse to very cold conditions. For those who would like to join a future team, it is worth noting that there are no mosquitoes to concern you on the Nyika plateau. It remains a very healthy and beautiful environment, whatever the season.

ON LINE ACCESS TO REPORTS – YEARS OF EXPLORATION AND DISCOVERY

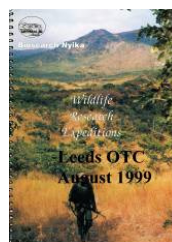
Each year we have published a detailed report of our expeditions and printed sufficient copies to provide for the requirements of the team and the Department of National Parks and wildlife. However, from 2010 we have decided to make all the reports available free on line to anyone who wishes to register. We hope this will encourage interest in researching the Nyika and pull together the information that we have on the biodiversity of the Park and the changes over time. Those reading the website version can click on any of the covers below to access previous reports. Hard copies of most reports are still available. Just [Contact Us](#) to order a copy.



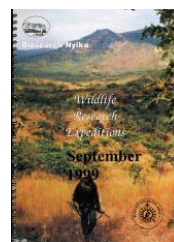
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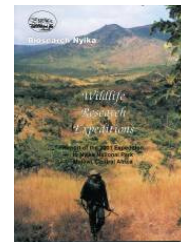
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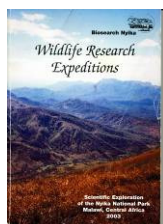
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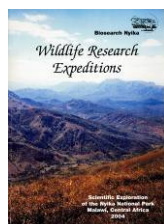
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2003



2004



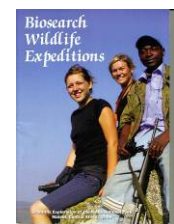
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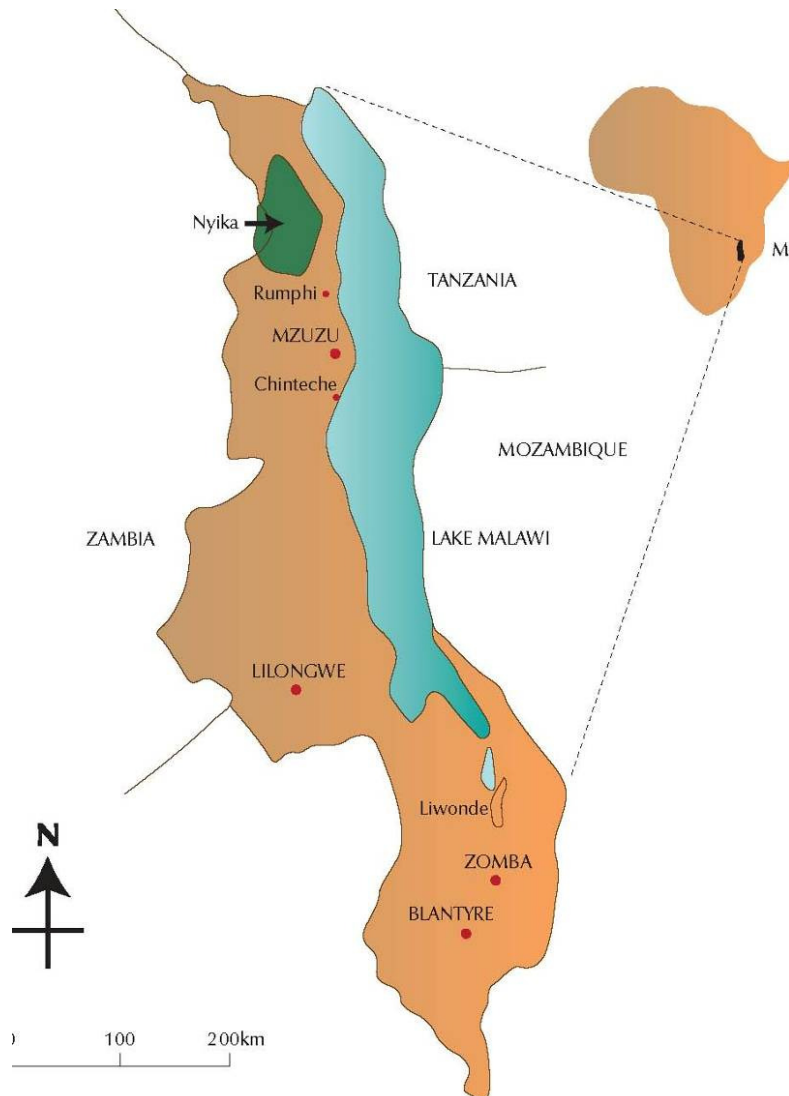
2007



2008

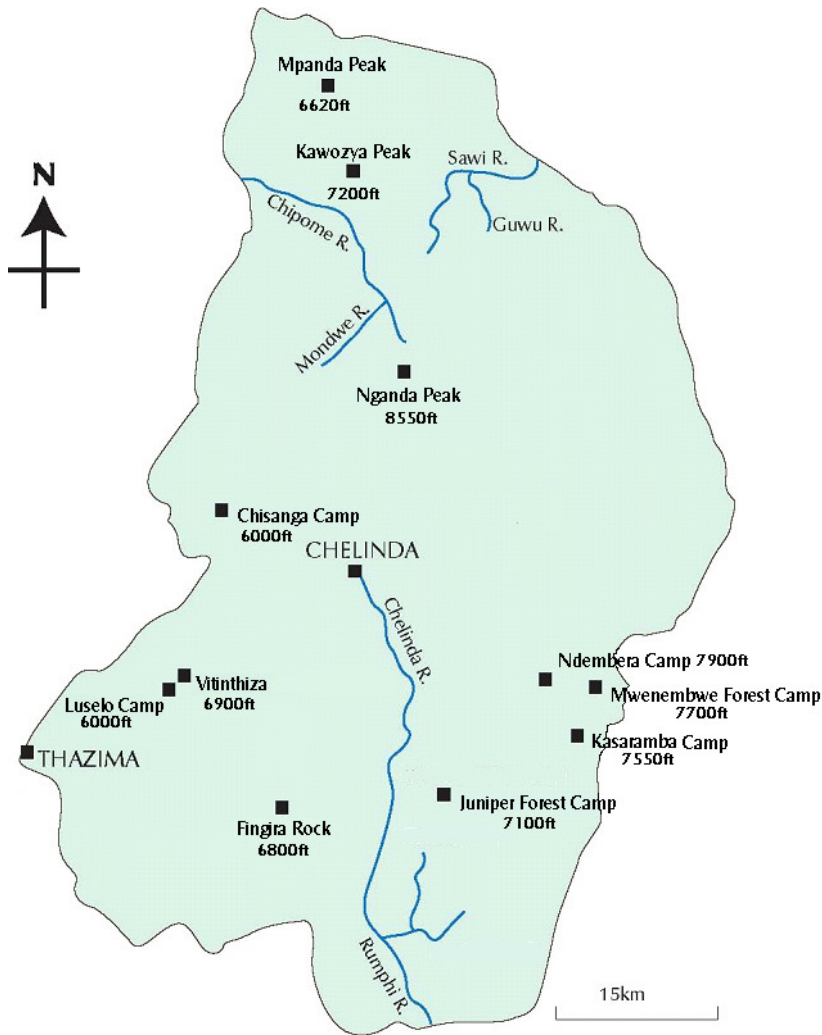
MALAWI

Landlocked Malawi lies at the southern end of the Great Rift Valley and is bounded by Mozambique, Zambia and Tanzania. It lies between 9° and 17° south of the equator. Its climate may be loosely described as sub-tropical but varies considerably, being much influenced by altitude and Lake Malawi, which forms much of the country's eastern border. The dry season is from May to November. Malawi has a rural economy based on subsistence farming and fishing on the lake but also with large tobacco and tea estates. The country is one of the world's poorest and is slightly smaller than England at 45,747 square miles. As more of the population migrates from the countryside, the towns are growing fast. The population, living mainly in the south of the country, is around 14.3 million, with an average life expectancy of 44 and very low survival rate for under 5's. The varied countryside is characterised by a string of high plateau regions from the north to the south of the country, of which Nyika is one, and isolated rocky intrusions which conspicuously stick out of the flat landscape.



Maps © Hilary Strickland, Biosearch Expeditions

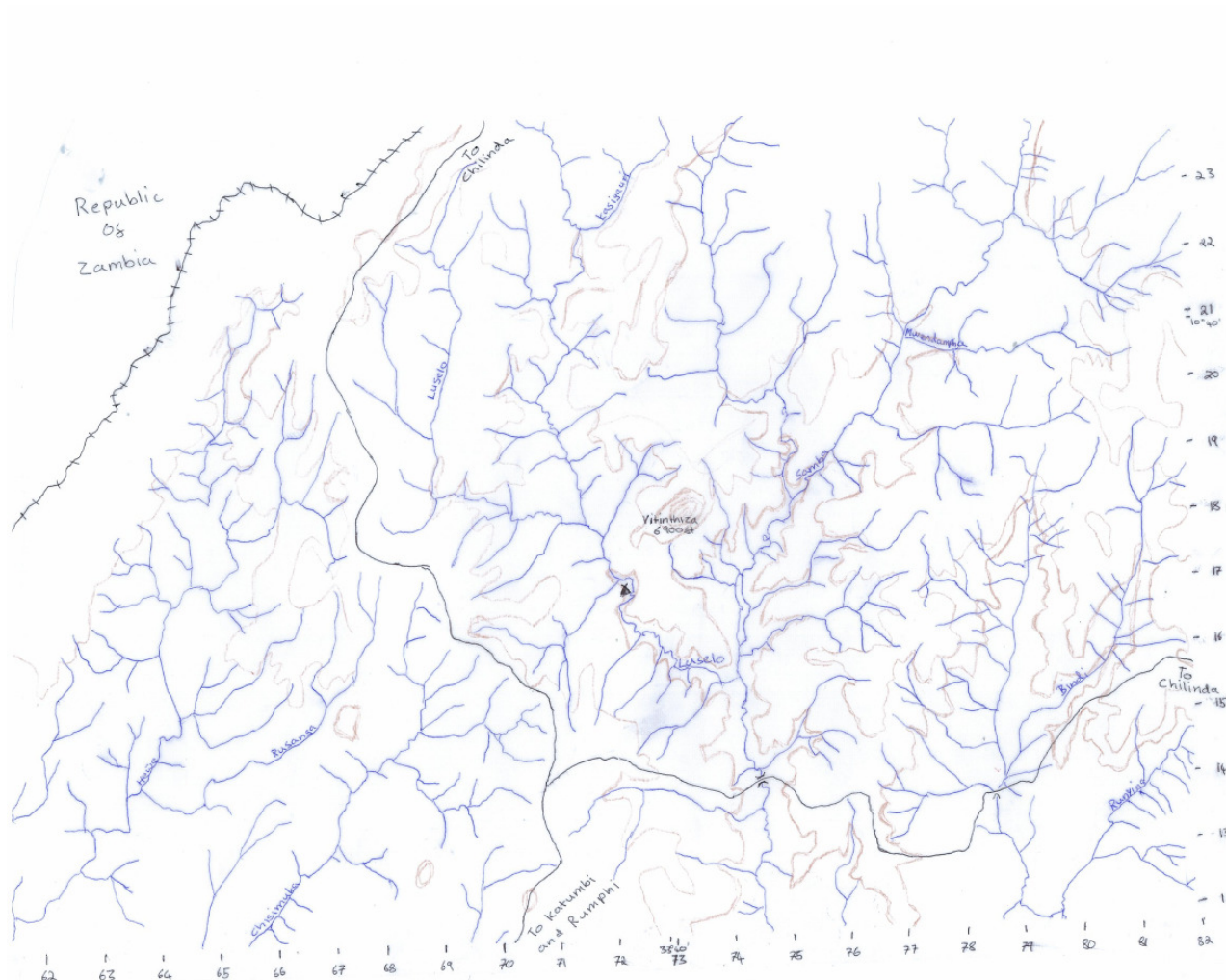
MAP OF NYIKA NATIONAL PARK



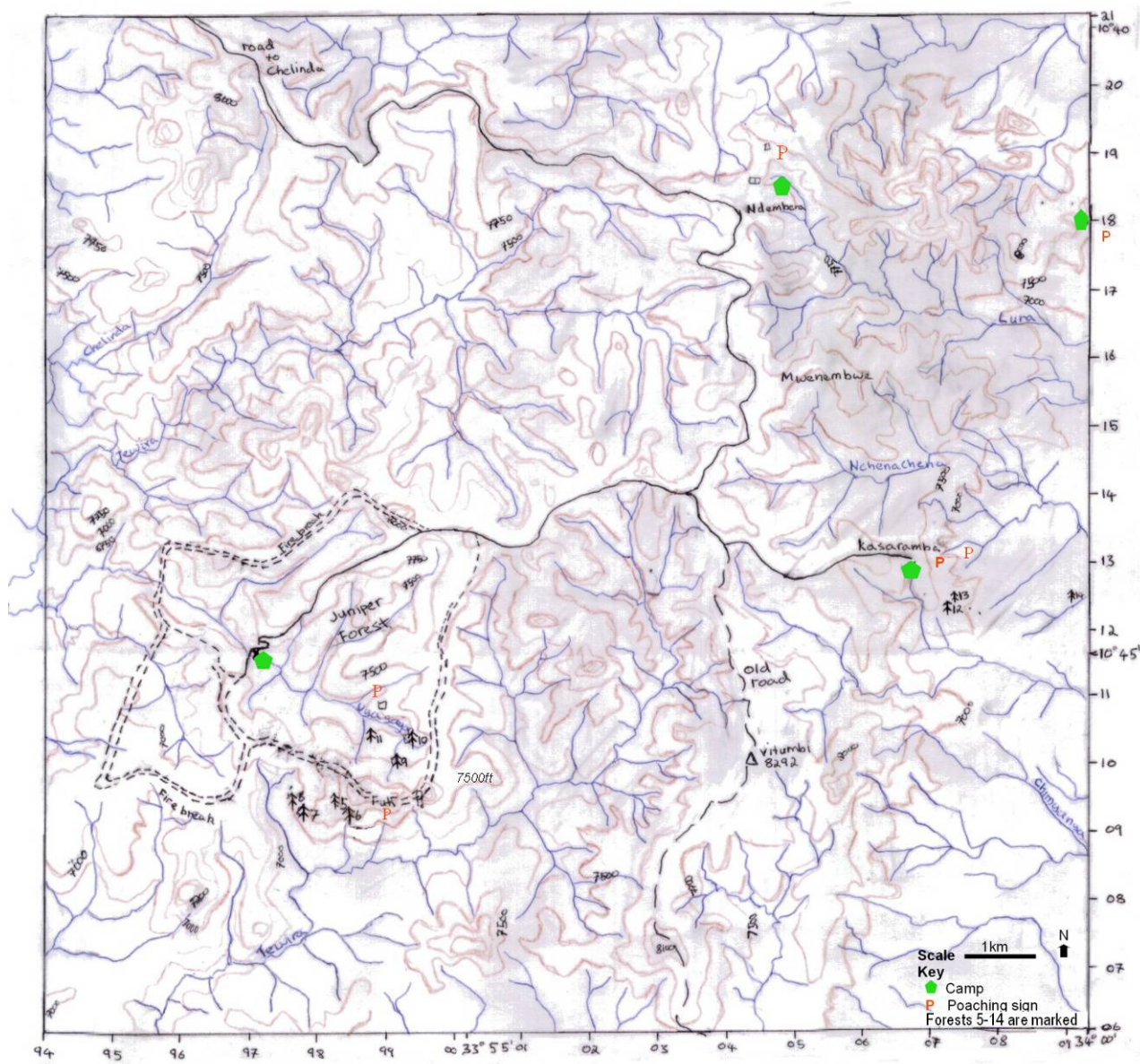
CAMPLOCATIONS						
2009 Camp Locations						
Date	Night s	Camps	Latitude	Longitude	Altitude ft	Map ref
July 27-30	4	Luselo	10° 42.30'	33° 39.70'	5987	723 171
July 31-2 Aug	3	Chisanga	10° 32.29'	33° 41.27'	6023	752 354
Aug 3-6	4	Juniper	10° 45.09'	33° 53.24'	7091	970 117
Aug 7-8	2	Kasaramba	10° 44.397'	33° 58.524'	7559	066 127
Aug 9, 12,13	3	Ndembera	10° 41.383'	33° 59.619'	7927	049 186
Aug 10-11	2	Mwenembwe Forest	10° 41.523'	34° 00.001'	7708	093 180
Aug-14	1	Kilometer 9	10° 47.152'	33° 39.067'	5782	675 078
Aug 15-16	2	Vwaza Kawiya Camp	10° 52.78'est	33° 30.66'	4050	558 975
Aug 17-19	2	Vwaza Lake Kasuni	11° 08.38'est	33° 38.38'	3478	702 686

SURVEY AREA IN THE NYIKA NATIONALPARK

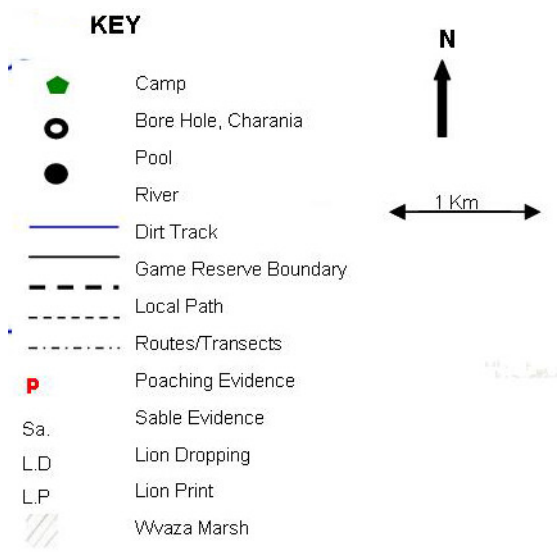
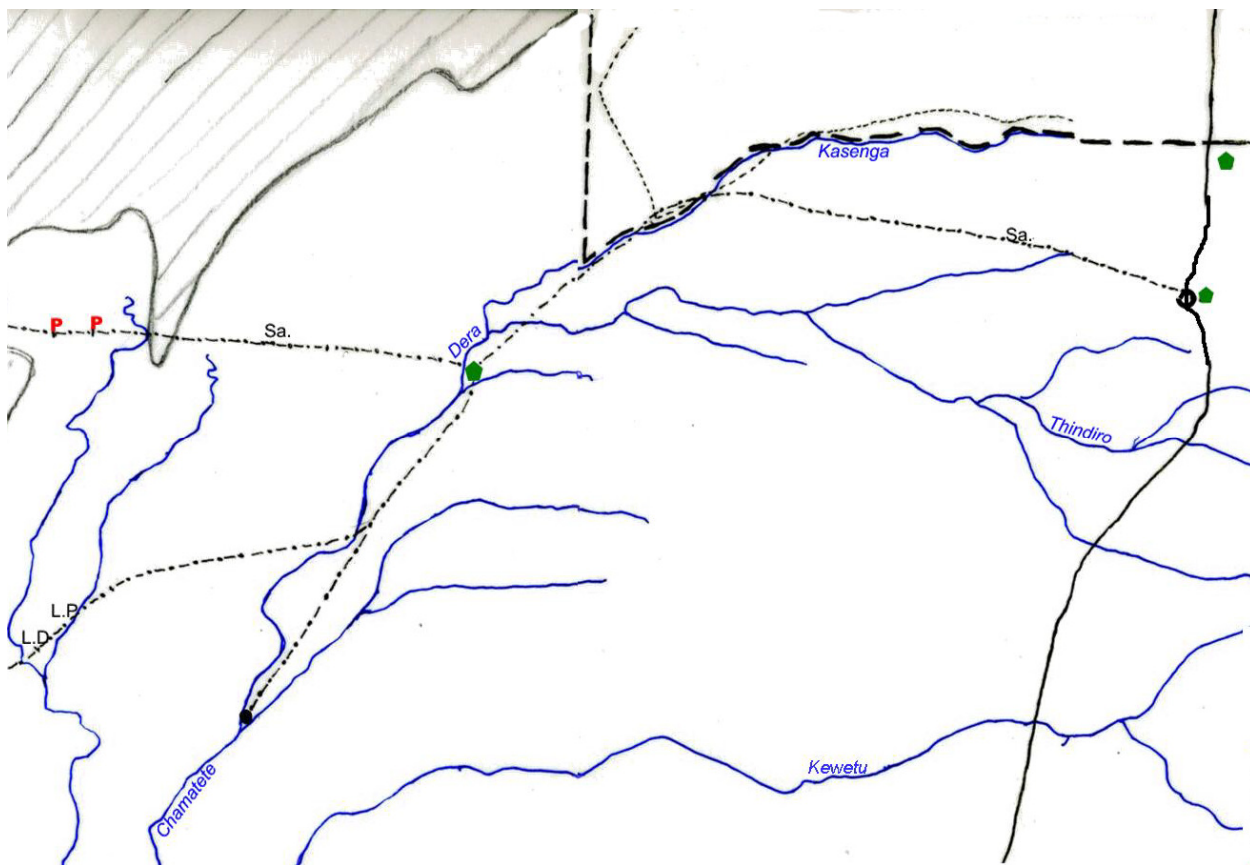
Luselo River and Vintiniza Area



Juniper, Kasaramba and Mwenembwe Forest areas



SURVEY AREA IN VWAZA MARSH RESERVE



THE EXPEDITION TEAM

Our team included scouts, wildlife officers, young people for whom this was a career move, experienced field workers and adults on a first expedition experience. For some the priority was scientific success. Others were seeking challenge and adventure in this Central African wilderness, whilst making a useful contribution to wildlife conservation in this developing country. Below is listed the British and Malawian leadership of the team, followed by the rest of the team in alphabetical order and finally our two extra support scouts and two excellent drivers from Lilongwe.



MARIANNE OVERTON

BSC(Hons) PGCE CBiol MSB FRGS

Marianne, Biosearch leader this year and science co-ordinator since 1996. Marianne was raised in East and South Africa and enjoyed leading field research expeditions in the Amazonas, Kenya, Arctic Norway, Yukon, Queensland and this series of expeditions to Malawi with Biosearch Nyika. Each expedition involved a wide range of ecological surveys with various sized teams, the largest being 81 in the field! She is a fellow of the Royal Geographical Society and has twice been regional chairman for the Institute of Biology in the U.K. and was a governor on the Board of Trustees of the University of Lincoln.

C. PETER OVERTON BSc (Hons)

Project Director of Biosearch. Peter joined the Wye College Nyika Expedition (1972) to the northern extension of the Park (as it now is). He has long experience in project organisation and management in the UK, including nearly 30 years involvement with the wild game industry. For the British Trust for Ornithology, Peter co-ordinates a regional team of voluntary researchers, contributing to national records and also sits on the Regional Network committee of the BTO to assist in the planning of nationwide surveys. He has organised all of the Biosearch expeditions since 1996 and personally led three of them, this year stepping aside for Marianne so he could organise a second expedition alongside.





SHAUN ALLINGHAM BSc(Hons)

This was Shaun's second expedition with Biosearch to the Nyika. His interests include herpetology, evolutionary biology, genetics of populations, conservation biology, ecology and paleobiology. Shaun has now started a PhD on maternal behaviour in poison arrow frogs of Costa Rica. Shaun's specific interests in African herpetology include spatial and temporal range in reptiles and amphibians and its importance in conservation.

Shaun also works part time at an aquatics and reptile centre and has previously travelled to Costa Rica to study amphibians and reptiles.

BEN CHESSUM

Ben is a student from Frome in Somerset. Ben led the Anti-poaching report, identifying signs with the assistance of the scouts and recording them carefully. He has just completed his GCSE levels and plans to do his "A" levels next; Psychology, Maths, Product Design and Further Maths. In future, Ben would hopefully return to do this again, finance permitting. Ben felt he had learned a lot and was wiser from the expedition experience. (More than "If you see a big cat, don't try to stroke it or pull its tail. It doesn't like it!")



CHRISTOPHER (KIT) CLAYTON

BSc(Hons) (Project leader)

This was Kit's second Biosearch expedition, the first being two years earlier in 2007. On this expedition, Kit initiated and led his own project on the *Ecology of evergreen forest patches*; working closely with Steven; identifying plants and looking at the distribution of different species across the forest patches in the Nyika. Kit had finished his degree in zoology and graduated just before the expedition.

"I wanted to have my own project on this expedition to give me a certain degree of independence. I hope to go into research and have an interest in entomology"



**SARAH FOWKES**

Sarah is studying Zoology at the University of Nottingham. She joined Peter and Marianne on their 'Wildlife Watch' adventures from an early age and has always had a keen interest in animals, especially mammals. Sarah's highlight of the trip was catching a glimpse of her favourite animal; an otter. A budding future David Attenborough, she hopes to travel much more after University.

STEVEN MPHAMBA

Steven is a herbarium assistant at Zomba for the Forestry Research Institute of Malawi (FRIM). Since 2003 he has been collecting seeds for the International Seed Bank and worked with the Darwin Initiative in Mozambique. He joined our team in 2007, 2008 and 2009 and is a highly valued as a team member. He also sings with a very successful choir from Zomba.

**GIBSON K KAONGA**

Senior Parks and Wildlife Scout
Gibson is based in the Wildlife Management Law Enforcement section, based at Thazima Camp. In 1987, Gibson started work in Kasungu National Park and then transferred to Chilinda Camp in 1995. Gibson joined Biosearch expedition teams in 1997, then based in the northern part of Nyika National Park at Nganda. 2009 was Gibson's second Biosearch expedition.



RICHARD NYIRENDA

Senior Parks and Wildlife Scout

This was Richard's ninth expedition with us, since joining us in 1997, with a particular interest in the bird life. This is a remarkable achievement and his all round expertise is greatly appreciated. Richard is based in the Law enforcement Section of the Parks and Wildlife Department and is now based at Thazima Camp. Since his employment in

August 1989, Richard has done a lot to benefit the Department of National Park and Wildlife at Chilinda, Uledi and Thazima, included assisting with many arrests.

"This research is helped by a new pair of binoculars from Peter Overton, which should be useful for many years to come."

SARAH SANDON

BA(Hons), PG Dip Ling

Sarah lives in Frome, working for Action on Disability and Development, also based there. She lived in Malawi as a youngster, but this was the first visit to the Nyika and Vwaza. The Biosearch expedition was a great opportunity to support the mammal and poaching surveys as well as to understand better the tensions and interdependence between development and conservation as they affect Malawi.



TIM WAYMAN

BSc (Hons) Natural Sciences



Tim was born on the family farm in Surfleet. Spending much of his early years in the outdoors, he gained a healthy respect for wildlife and nature. His main interest being trees, he was often seen climbing them and more often than not falling off of them.

A school camp in the Lake District set him off on a life-long interest in the mountains and has climbed many notable peaks all over the world. He admits to several mad moments, including jumping 135m down the world's longest Bungee jump and flying under the Humber Bridge.



ARIEL MOYO

Ariel is based at Thazima and stayed for the first two weeks of the expedition. Unfortunately his young daughter sustained an injury so he returned home with Peter just prior to the Mwenembwe Forest phase of the expedition. He was a good support to the team during the crucial early phases when the extra help was especially valuable.

HEATHERWICK KARUMBI

Heatherwick joined the team at Kawiya to assist with the northern Vwaza phase of the expedition and led us on the "Long March".



LEWIS MTUMBUKA



Senior Parks & Wildlife Scout (retired) Lewis is married to Mynas and has six children between the ages of 4 and 29. He has worked with the DNPW for 30 years, being on the Nyika (8yrs), Kasungu (7yrs), Nkhota kota (1yr), Kasungu (1½yrs) and Vwaza (10yrs). Lewis joined us on the wildlife monitoring at Vwaza. He has now accompanied our team on five consecutive years and has proved an invaluable source of experience. "I have benefited a lot and my real interest is in studying trees, as they are so significant to the Park. I wish I could join all the coming expeditions."



RAY MURPHY FRS

Ray Murphy, a Fellow of the Royal Entomological Society, has had a keen interest in Natural History all his life. He has collected insects widely in S America and Eastern Africa and has travelled up both the Amazon and the Orinoco. He went to Malawi in 1981 and has now retired there with the objective of finding which insects occur there and, in co-operation with specialists, get illustrated literature published on each group. He says that Malawi is the least explored, entomologically speaking, of all the African countries and that he is continually finding new species. The most astounding group has been the Metarbelid moths where 26 of the 45 species discovered there so far are new to science!

SIDNEY KAUNDA

Sidney has joined us on a number of occasions to assist with the entomological collections. He lives and works in Mzuzu and assists Ray Murphy with his collecting, having achieved a considerable degree of expertise himself. He can rapidly assess whether a species is worth further investigation or whether good specimens exist already.



JOE CHAZEWA

Joe Chaweza lives in Lilongwe and joined us for the entire trip, assisting with various complex vehicle movements, and occasionally repairs. Living on the Nyika Plateau was a new experience for him and when he realised that he would spend long periods in the bush with no driving to do, he soon decided to join the team to gather data and became a valuable member of the team.



THE EXPEDITION STORY

C Peter Overton and Marianne Overton

TRAINING PROGRAMME

Almost everyone attended the training programme at our base, Hilltop Farm, Welbourn in the UK over the May Bank Holiday Weekend. Great excitement was added this year as botanist Steven Mphamba was able to join us, being in England on a training course at Kew. Thus we held a lunch for all expeditioners, past and present. The training weekend itself is the first opportunity to get together, meet, chat and develop working relationships in a fun environment, whilst tackling some activities with varying degrees of ease. The range of experience in the team was fascinating, with some on their first expedition and some very experienced and very helpful in the training. Everyone mucked in and tackled cooking on open fires, wild camping, navigating on our trek around the countryside and tracking game, that is, the English varieties, including fox, badger, deer, hare and rabbit. We practised techniques useful in the bush and learnt about living safely in a wild environment without damaging it.



Some of the expedition team, including Steven Mphamba, over from Malawi on training course at Kew Herbarium
Peter Overton

THE ADVANCE PARTY

Peter flew out to Malawi a week ahead of the Biosearch team. This year we had been asked to assist with a group of 16 year old students to give them a nine day trek across the Nyika as part of a broader package of self development. It required some difficult vehicle management to satisfy the two groups simultaneously but it worked out fine, with careful programme planning and a little flexibility.

Korea Garden Lodge in Lilongwe was our launch pad for the Biosearch Expedition. This lodge seems to be a popular stop off for travellers with a modest budget but it does need some refreshing. The rooms are fading and essential repairs have been lacking since last year. Hot showers are no longer a certainty. The booking system is still very wobbly and early arrival and confirmation is essential. Christmas tree lights around the pool were being installed on our arrival but the same money spent on fixing the shower tap may have been a better use of resources! Nevertheless it remains a convenient and secure base from which to start.

STEPPING INTO AFRICA

Some of the team arrived in Lilongwe early. Two days prior to our departure for the Nyika, having had 24 hours in transit from home but were fed and watered at regular intervals and had a good break window shopping in Johannesburg. We were presented with leaflets warning us that people with flu would be turned back to Europe and to inform the authorities if flu-like symptoms developed in 7 days! Stepping into Africa, we were immediately confronted with the “haves” and the “have nots”, and we felt like rich people being met and driven to our accommodation in our 26-seater bus!

At crack of dawn, the two Sarahs, Tim and Marianne went in search of crocodiles! Joe drove us in the bus to the old Lilongwe Park (50K entry, not 900K like the new one) and Felix, our Parks authority scout, helped us creep up on a pile of slumbering crocodiles, complete with an ever-watchful night heron. Next we trekked through the bush and crept up on a Hyaena's den. We found ourselves face to face with a large hyaena returning from his nocturnal visit to the city slums.



Crocodiles at Lilongwe *Marianne Overton*

In the afternoon, we gathered everyone to visit the new privately-run sanctuary where we had a guided tour at feeding time. Yellow and Hamadry Baboons, Blue and Vervet monkeys, a sad lion rescued from Eastern Europe and some old friends moved over from the old park; a limping leopard, a tame Hyaena and the great African python that used to share a cage with clucking chickens.



Crocodile River in Lilongwe Nature Park
Marianne Overton

Jenny was our guide, as last year, and when Marianne reminded her who she was, she pointed out the leopard that no-one else had seen. That meant our group was alone at the end after the tourists had gone. Three lady gospel singers were being filmed for a DVD and we joined in, causing much hilarity.

Saturday was our shopping day and with the help of checklists and plenty of experience the operation was completed by midday. We used the outside fruit and vegetable market further along the road from Shoprite to buy all our fresh requirements. The prices and quality were excellent. Purchases from Shoprite should be restricted to cans and foods of restricted availability. By evening the whole team was assembled at Korea Garden Lodge!

MOVING UP-COUNTRY

Peter Overton

Amazingly, the whole team was ready at the bus by 10am, some having already having had an early stroll on a reconnaissance visit to the craft market. Prices seemed high as our exchange rate was dropping. We were usually able to get 250 kwacha to the pound sterling but the banks were offering only 225, well below last year's rate of 290. An added complication was that all the Forex bureaux were closed by the central bank at one stage although cash was readily available at the usual unofficial sources! Our trailer was at Ray's place near Mzuzu, so we packed everything onto the bus, which was no problem with our team size of nine; indeed even with 18 it is possible to get all the bags onto the back seats at a push and find seating for everyone, although it would not have been possible with provisions on board. This time no-one needed to come in on the midday flight, and leaving early meant we gained at least three hours on our usual schedule and arrived at Chikangawa in daylight. At Kasito Lodge we found beds for some but as before some had to camp; the booking system remains vague. I had agreed everything just seven days earlier when passing through but to no advantage. This is not to say that the caretaker, Mr Matemba, was not his usual charming and helpful self. It does, however, remain the case that it is best to assume that you will have to camp on arrival. We filled our bellies happily and Tim, a member of the magic circle in the UK, did a brilliant rope trick much to our amusement. A night search revealed three flap-necked chameleons in the Bottle-brush tree.



Flap-necked Chamaeleon
Marianne Overton

On Monday, as we continued towards Nyika, we had just a short stop in Mzuzu for fuel and some shopping, before heading on to collect our trailer and enjoy an inspection of Ray Murphy's fantastic reference collection of mounted insects. His wife Mary showed us rooms full of turkey and chicken chicks, and outside, a milking cow, goats, sheep and pigs.



Ray Murphy

Marianne Overton

Ray's assistant, Sydney Kaunda took us to see bricks being made by three young men who were saving for school fees. They dug the best clay from a huge termite mound, shaped the bricks in a simple wooden mould, laid them out on straw to dry in the sun and then baked them for 8-10 hours in a clay-sealed stack, fired by *Brachystegia* wood which burns with a good slow heat. From the bricks, Sydney had created a holiday lodge, available for hire. Bricks cost 1kwacha to make and sell at 5 kwacha per brick and they had 11,000 in each stack!

Having pre-arranged for Richard Nyirenda, Gibson Kaonga and Ariel Moio to be ready at Thazima gate we were able to make a swift passage to the Luselo campsite and we arrived at 4.30 pm and were set up well before dark again with an excellent vegetable stew. The camp was as rewarding as ever, with its sheltered setting, waterfall swimming pool and alive with otter tracks and game.

CLOSE ENCOUNTERS

Marianne Overton

The first day out from Luselo, we made use of the bus to get to our survey area where Sarah Fowkes took charge of the mammal survey work. Elephant had been recently seen, but not by us that day. Instead we had a most remarkable experience. In our survey line formation, we passed over an island of long grass in a desert of burnt area. A duiker ran but did not want to leave the grass and so almost bowled Ben over, and raced round him as he stood stock still getting the most amazing action shots with his camera. Sadly, when viewing them at lunchtime, he accidentally deleted the lot! He was gutted and went to bed with no supper, tempted only by a Mars bar.

A most amazing thing happened two days later, which made me think someone up there was looking out for Ben. Leading the trek in single file through open woodland, Richard stopped as a nightjar flew suddenly out from under his feet.

"Amazing camouflage", I said. "If it was sitting right here at my feet, you wouldn't see it!" I pointed down, without looking down.

"What is that, right there?" said Sarah, standing next to me.

It was a faun, a baby Common duiker just a few days old. It didn't budge, just an eyelid opened to reveal the most beautiful almond eyes, long lashed and dark in the soft fur. What a joy! We photographed it and left it as we found it, and were glad to see the mother doubling back round towards it. Over the next weeks, I asked all the scouts who live much of the time in the bush, if they had ever experienced anything like that. They had not.



Ben with young Duiker Sarah Sandon

The same day, we clambered through a densely forested marsh and headed for a lake not marked on the map, but visible from the top of Mt. Vitinthiza. We sought amphibians and the Black Crake, recorded by a Biosearch expedition in 2008 at a different lake, not far away. Tramping in huge elephant footsteps through the marshy edge, we found some tiny frogs and stopped for lunch overlooking the lake to wait. Sure enough, a pair of Black Crake gradually appeared, rich reward indeed.

The day before, we followed a trail of jackal and porcupine droppings up Vitinthiza (7800ft) for a fantastic panoramic view, sat astride huge boulders, above stunted trees festooned with orchids and 'old man's beard'. A klipspringer trumpeted at us for a long time before we took the hint and moved off. On the way up, with sparkling dew heavy on the grass, we rounded a bend to hear a clear, sharp bark. About thirty Baboons were idling in the warmth of the morning sun, noisily cracking open *Brachystegia* seedpods for breakfast.



A TYPICAL CAMP EVENING

It is always good to have an event the night before moving camp, so we had plenty of such "events" on this expedition. The night before leaving our lovely Luselo campsite, after an excellent meal rounded off with pineapple cooked in passion fruit, we launched into Sarah's idea of "Show and Tell". Tim did a variation of his rope trick, being ever more imaginative and inventive every time we saw it. Peter, having just returned to camp after his night away, told an excellent funny story

about what happened to some honey given to him by a village headman in the Nyika northern hills, nearly forty years ago. Sarah did a piece about otters and Marianne did Melanie's beetle song, relating it to her childhood in similar terrain, always with bare feet! Richard did a "Choo Choo" dance which everyone loved. Then Sarah, Shaun and Marianne went on a successful night hunt for frogs and an unsuccessful hunt for porcupines.

MOVE TO CHISANGA FALLS

We transferred to Chisanga Falls for three nights, leaving spare food and equipment under



Chisanga Falls

Tim Wayman

the guard of two scouts in a patch of *Brachystegia* woodland on the edge of the road, opposite the track down to Chisanga. This released the bus to collect the school team from Vwaza after their three night stay and take them to their next school building project north of Ekwendeni. This was the last transport we provided for them until we collected them from Nkhata Bay ten days later to take them back to Lilongwe, when Peter joined them for his own exit.

We stopped at Zovo Chipolo Forest, a wonderful magic land with huge buttress-root trees, lianas and a flowering under storey which kept our botanists busy. Our camp close to Chisanga falls was idyllic, with our swimming river right adjacent to the tents, but protected from the falls by trees fallen across it. Adjacent was a rocky outcrop for our evening ritual; drinking sweet, after-supper Milo and watching the sun turn deep orange, adding rich colour to the deep purple *Dissotis* flowers and to our tanned faces. We watched the starlings go to roost, diving through the water flow of the falls.

Our first field supper at Chisanga was surprisingly good; rice and vegetables in *Boeuf Bourginon* sauce, followed by marshmallows and a round of entertainments; great fun. The next night, our simple supper was of tomato, onion, peppers, *coq au vin* sauce, mashed potato and lettuce relish, followed by a lovely big fire. Shaun and I went on a long and unproductive amphibian night hunt, crawling through riverine forest and grassland, only to return and find a beautiful specimen waiting for Shaun above the front door of his tent!

Our days were spent out walking to our survey areas, recording illegal poacher activities which included burnt holes where bees had been extinguished and their honey robbed. The legal hives were thriving and we kept well clear of them. There were also bare human footprints of poachers and reeds used for illegal fishing.

Each forest is unique. One large, wet forest beside the main North Rukuru River was especially enchanting, with many small streams and prints of a female elephant and calf, otter and buck. The thick-trunked dominant tree, *Syzigium* was coming into flower, attracting the butterflies and sunbirds whose constant gentle calls made a happy sound. A huge fig tree was richly festooned with unripe fruit. Weirdly, the tree trunks were all neatly wrapped in caterpillar silk. During our day's walk we had all, to a man, contracted a most persistent and irritating rash on our exposed arms and ankles. It was to last for a number of days and we are still not sure what caused the problem. Many thought the problem was midge bites but others discounted this. It was the first time any expedition team had

experienced this but we do at least know the offending location, which was the marsh upstream from our camp. Others beware!

It had taken us 35 minutes to climb down the 800m with full packs and 50 minutes to get back up, walking slow and steady, "like an elephant". Thankfully, Joe the driver and the two scouts, Gibson and Aria, were there ready for us, with the bus loaded. They had been expected to join us in the valley the day before, but instead had chased after gunshots, though unfortunately didn't manage to apprehend the poachers this time.



We stopped to pay homage to the home of the Great Spirit, at the only natural Lake in the Park, Lake Kaulime. This sheltered lake on the plateau top formed a refuge for Roan Antelope who were not much bothered by our presence.

Roan antelope at Lake Kaulime

Tim Wayman

We could not pass the Camp at Chilinda without a stop at the local shop to purchase soap, tea, toothpaste and oil. It had little else. The "tourist shop" at the dining room had honey, milk powder and soup, all of which we cleared! There were no beers or soft drinks available as there was little tourism at present. The sawmill was silent and the forest lay felled on the ground, awaiting collection. We found Charles, now in charge of 18 scouts at Chilinda and told him about our reports, to be found at Thazima, though from his point of view, that was not much use! There is a real problem with transport again as vehicles regularly break down on the rough roads. Sometimes scouts have to walk huge distances to and from patrols, limiting the distance they can go and sadly that gives poachers more freedom. We saw a pile of scrap bicycles used for spare parts. Shaun was interested to see the faded bottled reptiles in the Park office, Sarah the mammal skulls and Steven the herbarium cupboard with ancient plant specimens.

JUNIPER FOREST (7060FT)

Peter Overton

From Chisanga we travelled to Juniper Forest for three nights. It took, as expected, over three hours from Chilinda, and we recorded good sightings of game; Warthog, Reedbuck, Roan, Eland and Duiker. The disintegrating section of road, where it is cut into the hillside, about one hour before reaching Juniper (map ref. 040147), was as bad as ever. We all got out of the bus to assist its passage and try to save the springs from further breakage. The main problem is a small number of very deep potholes, which could be filled at little cost. The roller coaster trip down this section was completed without mishap and on the return journey we even ascended without dismounting the team, although there were some nervous moments. There is another hazard in the form of a rock protruding some half metre vertically on one track, about half a kilometre before arriving at Juniper. It is not possible to circumvent it, since it is in a cutting. Removing the top would undoubtedly save damage to vehicles. Although there are other sections on the track from Chilinda which are difficult, the journey would be transformed by attention to just these two.

The site at Juniper Forest was unchanged. The all-important firebreak had been painstakingly cleared by hand. An old drop loo, with a hole as big as a room, was put back

into use. The lovely evening sunshine brightened the camp with a cooking area on a sheltered huge granite outcrop above the lovely falls with separate drinking and washing shelves.

FOREST EXPLORATION IN SEARCH OF BLUE MONKEYS

Marianne Overton

We took the old track up Mount Futi to 8000ft and divided into two groups to do forest and field survey plots. We crossed the old boundary of the Park, marking its previously much smaller extent of 980 km². Ben crept up on three Klipspringers which was not easy! We found many signs of the Blue Monkey; calls, smell, a slide, feeding scratches and holes and the tops knocked off termite mounds close to the forest. In another forest were excellent signs of Red Forest Duiker droppings and browsing on undergrowth.

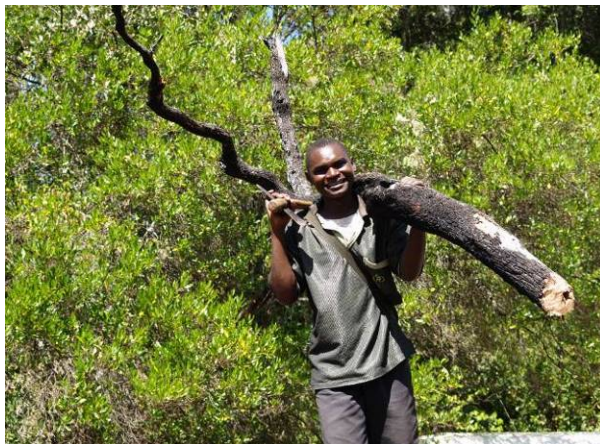
The sight of ancient kilns perched on ledges, where iron was smelted in a steep-sided riverine forest gorge was an exciting find and we felt really touched by the past. Melted iron had poured down the side of the kiln, about 1.5m across and the same height. The clay pipes fitted into holes at the base of the kiln and would have been attached to skin bellows. It was man's work and they would stay in the forest until the work was done. Apparently smelting was done here from 300BC to the 19th century. In one of the other forests with a really huge Juniper Tree, we found many snares, set and ready for the poacher to return. Also we found a camp just inside the forest, from where they could observe without being seen.

Richard proved yet again to be an exceptional scout. I lost my green hat in the green undergrowth and he was able to retrace my lone and winding path a long way through the forest and find it. We were separated from half the team that day and Richard followed their tracks identifying the grass tussocks flattened by boots rather than hooves, a subtle difference to the rest of us!

THE WORLD AT OUR FEET – KASARAMBA!

On the next leg of the journey to the Kasaramba viewpoint we were pleased to discover that there had been some track maintenance and although it was narrow in places, passage was not a problem. The mist thickened and the wind blew. The bus rumbled and tumbled over the bumps up to the cold and windy viewpoint at 7,800ft. The team was torn between getting out to take photos and avoiding the chilly blast. There were magnificent views across to Livingstonia, Junju, Rubu and into the Henga Valley and Nchena Nchena below. We could even see Scout Daniel Zygambo's house. Far to the south the Viphya hills were visible in the haze. The plateau drops into rolling folds like a curtain to the floor of the Great Rift Valley below. Immediately over the sharp edge the terrain was velvety with ancient evergreen rainforest, dripping with long tendrils of sea-green lichens – our destination for the next foray.

Just down the bank in the lee of the hill we found a beautiful small valley, where our tents snuggled into the vegetation as if they had grown there. Below were a poacher camp and a small waterfall amid gorgeous tree



Ariel Moyo

Tim Wayman

ferns. We formed a chain to get water up the very steep bank. The camp had been used by poachers recently and judging by the wisps of smoke visible for miles, it may have been reclaimed by them the day after we left!

It was heart-warming to see everyone happy and busy, feeling at home in no time at all. Bus driver Jo, our driver, was helping Steven collect new seeds for the Millennium Seed Bank in the UK, Shaun and scouts set live traps for amphibians and reptiles,

Tim was improving the firewood collection, Ben was whittling wood and chatting to Kit about his forest project. Marianne baked bread with the orange peel we had crystallised, and joined Peter and Richard on the slope above the camp bird watching. We found the rare Blue Swallows that are one of Nyika's specialities, a mountain nightjar and an eagle we could not identify. Then on the skyline behind the swallows, far on the opposite hillside, appeared two human figures!

Ray Murphy and Sydney Kaunda had found us. After a brief stay, they set off again for Juniper Forest, arranging to meet and provide emergency exit vehicle coverage for the four days between the departure of the expedition bus and the arrival of a land rover for the final stages of the expedition to Vwaza and back to Lilongwe. He spent three nights at Juniper Forest, which was undoubtedly a better location for collecting flying insects, while we explored the eastern escarpment below Kasaramba. This is one part of the Nyika National Park where excellent cell phone coverage is available, with line of sight to a transmitter mast far below. Unfortunately several power sources, for both phones and cameras were starting to fade at this point. Re-chargers with vehicle cigarette lighter connectors would have been helpful. In the event I took some equipment back with me to Lilongwe to recharge and sent it back up again with the Landover. Luckily there was sufficient photo power within the team to continue in the interim. I still take a film SLR to cover for this problem. Last year it came into use when a digital camera got dropped in a stream and ceased to function. Sadly, this year, the two films were lost in the post on their way for processing. One was returned thirteen weeks later and the other did not arrive at all. This is probably the last year that I shall use processed paid film since lost films do occur from time to time and always seem to be just the photos you particularly wanted!

POACHER SNARES GALORE

Heavy mist descended after the mountain nightjar's dawn call. We agreed to keep as tight a group as possible, following a simple route along the stream, with a scout at each end of our brave group as it disappeared into a thickening fog! As we crossed the ridge, each new detail materialised before our eyes and the mist cleared. It was a rich verdant sight with rainforest in every direction and small strips of grass on the ridges. The forests had huge trees covered with lichen. There were mosses draped densely and the trees were thick with vines and undergrowth. In the hollows, where water trickled intermittently above and below ground, were huge elegant forests of tree ferns, themselves host to other graceful ferns and mosses.

The beauty was all the more fragile, poignant, as we found the remains of a snared and butchered Blue Monkey which sadly must have struggled a long time and dragged itself a long distance: A horrible death for such a rare and fine animal. Snares at the forest edge were common and two trails through the forest led us to a total of eleven snares, set ready. The monkeys live in the forest, but come out onto the grassland to feed; digging small, deep, burrows at the roots of grass and herbs. Here we also found signs of Leopard, which probably prey on the monkeys and the Red-winged Francolin there. Red Forest Duiker browsed in forest clearings where Acanthaceae grew well and even out in the open, wherever the flowers grew. Kit did his fourteenth and last forest survey, a special forest in which he discovered an ancient decorated clay pot.

We next discovered that the GPS was missing. Shaun and Richard went back down the steep slope to try to find it but had no luck. The next day a team of five returned down the mountain, into the ever-thickening mist. We picked up our path from the previous day and diligently searched in every tuft of grass for two hours. We were on the verge of giving up, when Richard found it lying vertically in the long grass. It really was as close to a needle in a haystack as you could imagine. There was great rejoicing, especially from Richard, who prided himself in his being able to find virtually anything anywhere - and we knew well not to dispute the claim! Gibson found a 12th snare and some further investigation helped them design a strategy to trap the poachers at the next opportunity. We returned to the top after three hours, by 11.30am we were all ready to move to our final camp on the Nyika, Mwenembwe Forest, a rarely visited part of the Park and an area we had been encouraged to visit by Heatherwick Msiska, as assistant scientific officer for the Nyika National Park.

MWENEMBWE FOREST

Peter Overton

We left the locked trailer containing surplus supplies and baggage on the roadside, where a small track turns off towards Mwenembwe Forest. It also acted as a marker for Ray Murphy to meet us. Our next camp was alongside a stream sheltered below the peak of Ndembera. The stream appeared and disappeared below the peat making it easy to fall through, as one of our team discovered! It was like getting water out of a well, but further down was a waterfall that caught the evening sun beautifully to lift the spirits of any downhearted souls and it seemed to make the sunbirds sing. We made sure everyone was well fed and had a party to mark our last night



Camp above Mwenembwe *Tim Wayman*

altogether in the wild. Gibson started with a dance and song; Tim did yet another rope trick; Sarah and Marianne did the Stanley Holloway poem 'Albert and the lion'; Ben with assistants, acted out the sketch he had written himself; Shaun won mastermind on reptiles and amphibians; Sarah did a song in Spanish "to get to heaven, you have to have a bit of fun first"; Stephen did a Malawian poem 'the great axe'; Peter sang "Nyika Moor Bar Tat". Finally we all joined Richard in the "choo choo" dance. Farewell speeches followed, from and to Steven and Ariel before they disappeared into the darkness with Joe to the bus. Peter followed on later at crack of dawn. Although it was only a twenty minute walk to the vehicle over the hill, it was the first time in many years that I had travelled in the wilderness completely alone. It was a special experience; slightly unnerving following Richard's account of his direct encounter with a lion in similar circumstances. On that occasion he said he backed away turned, and did not stop running for over an hour! However, it was also uplifting since it represented the completion of yet another in a long series of explorations of this magnificent wilderness of the Nyika National Park.

FURTHER ADVENTURES WITH A SMALLER TEAM

Marianne Overton

We followed a trail, sadly well worn by poachers who had dug up orchids and hunted with dogs. We travelled over the high peaks and settled into a dell with huge tufts of grass, a fresh running stream and a forest patch in which we camped. We easily found poacher stopping places, and even litter such as an empty match box by an illegal fire. We did some survey plots and clambered through a dense forest with huge tree ferns. The rainforests here hang in the prevailing winds, wet as the rising air cools and drops its moisture. Thus it is rich in abundant growth and flowers all year round.

EARTHQUAKE

At 1.05am, there was a huge noise and the earth shook from side to side. The tremor seemed to last a long time. We woke, but went straight back to sleep. Even without an earthquake, Kit fell in the swamp on his way back from an early trip out at dawn and Ben did a similar thing the following day!



PROTECTING THE FOREST

By nine o'clock we were at the highest point on the sharp edge, overlooking the Great Rift Valley, the earth falling away at our feet into steep cliffs covered with bushes and dense forests. As far as the eye could see, the escarpments were the same. Below in the valley were people. The Park Boundary was very obvious by the almost complete lack of trees outside the line. At least four very clear paths, large and well used, ran up the ridges, straight from the villages into the Park, paths large enough to carry planks out of the forest. We heard a hunting dog barking for a long time. We worked our way down through the forest and were delighted with its abundance, beautiful flowers and a pair of gorgeous Schalow's Louries. We stopped in a clearing near where medicinal tree roots had been savaged and two big trees cut down. The sound of wood chopping sent our scouts, Richard and Gibson flying down the escarpment, while we sat low and quiet until they returned. It was women cutting close to the boundary, and the scouts delivered a firm warning. At least the message would be broadcast that the area is patrolled. Poachers sometimes cut the trees and then return months later, to cut it into planks when the wood is dry.

Looking north-east we had a magnificent view of the shining lake and rolling folding mountain sides tumbling down to meet it. Looking back into the Park, we saw the tiny pimple of Ray Murphy's white van crawling about in this vast landscape. We could see it stopping, the occupants getting out and searching for us. We waved our coats furiously, but we were 10km away in the shadow of cloud, whilst they were in bright sunlight. Identifying our relative positions on the map revealed that the nearest connection was back via the trailer. It was too far.

With the extra time needed to chase poachers, we did not have time to send anyone back to find Ray at the other camp. The warm evening sun brought two new frogs, gorgeous Spotted Sedge Frogs. To complete the day, I walked as fast as I safely could through the long tussocks to catch the last of the sun's rays on a ridge overlooking the Rift Valley. There was dense, lush rainforest on three sides, inhabited by Blue Monkeys and Red Forest Duikers, with waterfalls and birds calling, their plumage full of colour, an enchanting moment!

BLUE MONKEYS AT LAST



Blue Monkey (LLW Nature Sanctuary)
Tim Wayman

Our fast team, Richard, Kit and Shaun set off at 6am to catch Ray at our meeting point, though as it turned out, they were out of luck. Ben had hurt his ankle and rested in camp. We took a different path, towards Junju where there was also many signs of poaching. We did a mammal survey plot that ended above a precipice. I called to locate Tim, the next in line, as the scrub was way above our heads. I was answered by a Blue Monkey!

We had a break and watched for a long time but though they called and moved the branches, only once did one of them show itself in the cleft of a tree. We all felt it had been a very special experience.

Ben had recovered and was able to carry his full pack over the 8,200 ft mountain back to our Ndbera camp. It took two hours; we arrived at the agreed time. Richard had been to the trailer and picked up a note advising us that Ray was camped nearby. The next day, Gibson took Kit to join him for some entomology. We had a day in the forests and hills near Ndbera. We arrived back at the trailer just as Sydney appeared with a

box containing yet another chamaeleon it was a Stump-tailed dwarf chamaeleon! I have searched diligently for many years for this and never found one. It is the smallest in Malawi

and looks exactly like a fallen leaf. (Photo under Cameo of a Chamaeleon later in this report.)

ONWARDS TO CHILINDA AND POACHER ARREST



Arrested poachers - Chilinda *Tim Wayman*

Joe arrived over the horizon on time with the new vehicle, a long wheel base landrover with ten seats, just sufficient for our requirements with the trailer behind. We headed for Chilinda, aiming for a hot shower and bed, but had no luck! Noisy felling of trees had started here in earnest. We cooked ourselves an excellent meal, but the hot water didn't appear and the warden said he had a school group coming in, so we decided to move on. Two related poachers had been arrested and brought in by three scouts and at dusk the manager returned with a Zebra which had been killed.

We travelled to a camp 9km from the Park Gate, arriving in the dark having seen a hare and a pair of honey badgers on the road. We surprised Ray, Sydney and Kit and amazingly everyone had their tents up in no time, so we could examine the activity at the moth traps. In the morning, it was wonderful to see everyone diligently writing their reports and making sure they had all the information gathered from each other's notebooks. We also sorted the gifts into

piles for each scout and we had a presentation to Gibson as it was his last day with us this year. As a thank you, we presented him with a pair of binoculars donated by Tim. We next had a very good meeting at the main office at Thazima Gate, thanking the Director and Staff for their brilliant support.

THE BIG WALK

We drove on to the north of Vwaza Marsh Game Reserve, to a very dry Kawiya Scout Camp, where we were welcomed, given a place to put our tents for the night and given water, pumped from the well. "Two hours to get to the Big Pool, so up early, please," said I. However, it was not until 8.30am that we managed to extract Kit from the comfort of his three course breakfast at Ray's entomology bus. Heatherwick was our scout guide. Three hours later he said "Richard, we are somehow lost!" which threw some of us into a panic. Reaching for the maps, compass and GPS we calculated we were about one kilometre out, so Tim took over as navigator, but he rightly stopped when the expected river did not appear. Richard was mad because the GPS clearly indicated where we camped and we should head for that point. He was right, of course! We tramped around the dry burnt earth, finding poacher signs and eventually got to the path we had missed, then onto the big pool, now a marsh where we cooled our feet, ate peanuts and raisins and caught frogs.

Richard predicted we would not be back before 7.30pm, so I bet him his supper that we would! The return journey was fast and according to my GPS, mainly in the wrong direction, the primary aim of Heatherwick being to keep out of the Park at night, I supposed. We were getting rather light-headed with dehydration. Suddenly, out of nowhere, appeared an incredibly tidy farm, where every leaf was swept away from the paths and huts. An Ngoni instructed his prettily dressed daughter to bring us a tray and glasses, and she knelt to offer us the sweetest water I have ever tasted. Next we came across two men running an orange farm for the local MP on the border of the Park, creating huge temptation for the elephants. They kindly gave us some of their crop. One man was from Mozambique and spoke Portuguese, the other from Nkhata Bay, who was obviously well educated and spoke

beautiful English. Next we came across an irate woman who called to us to come and protect her crop from elephants tonight. "Fifty seven came last night!" she said. We finally limped back into camp at 6.15pm after a very long day's walk. It was just dark too but we let Richard have his supper anyway! Amazingly, no-one was even stiff the next day, so we must have been quite fit.

ROBBERY BY ELEPHANTS AND HUMANS

That night, the elephants did come back and poor Heatherwick was roused from his bed to go and see them off by firing shots into the air. Richard heard the shots but misjudged the direction because of the wind and couldn't find him. Heatherwick was upset because the villagers blamed him, which seemed patently unfair to me. It seemed no good trying to grow oranges next to elephants and expecting them not to come and get them! Worse, the oranges have to be irrigated with water from deep boreholes, which lowers the water table, making that part of the Park drier still. Some villages have had to be abandoned as the water has diminished and many have to travel long distances to get their water.

The wind was rather fierce and dusty and no-one could sweep their yards in the morning. Children soon arrived with four Flap-necked Chameleons, all in the same bucket and all different colours – how strange! Getting them out to photograph I could see that Mr Grumpy, as we called him, had his side facing me brown, the same as the tree trunk behind and the other side facing the tree was green as a leaf. How clever!

We visited Heatherwick's home and met his wife, Maria who is a skilled maker of clay pots. We left a few small presents, met up with the entomologists and set off to Bolero for bread, flour and onions. You can get phones charged here for 50 kwacha. Ray phoned home and discovered that Mary had been robbed in Mzuzu of a whole months' money, so had nothing to pay the staff and nothing for food. I bought some beans and fish and he had to go home.



Maria with one of her own clay pots
Tim Wayman

HIPPOS, ELEPHANTS AND CROCODILES AT KASUNI

Kit and Sydney now joined us and we drove to Kasuni, where we were welcomed and set up camp. We found a meeting in progress training scouts on how to give evidence at court. We met Mr Suede, Edwin and other friends that we had met previously over the years. Walking out in the afternoon, Kasuni immediately provided us with the spectacle of a great many hippos, three crocodiles, about 50 elephants and a troop of baboons. A successful day, a good wash and a good meal raised the morale of the expeditioners!

THE SANCTUARY

Lewis Mtumbuka came out of retirement to guide us to the wildlife sanctuary in the reserve. It took us around two and a half hours, being 25 miles to the gate. Sydney found an enormous stick insect which everyone admired before it was taken as a specimen for the reference collection. Fortunately there were many stick insect eggs on the ground nearby. We took a 5km hike following the lonesome hippo prints along the perimeter fence to the river, but the game was sparse, except close to the river. The sanctuary is about 30km² and stocked with Sable, Hartebeest, Roan, Impala and Puku, plus the one Hippo trying to find a way out.

Next morning we drove round to where the Buffalo had been seen the day before but they had already left. We enjoyed the walk back seeing much on the way. Sadly we saw tobacco crops being planted inside the Park and upstream from the Lake. Usually these crops have a dressing of fertilizer, which can cause eutrophication of the lake in the warm season, oxygen depletion, death of fish and then blue-green algal blooms. This would make the water poisonous, killing the game and possibly even the people who rely on the lake for

drinking water. We also saw villagers in crowds coming to wash clothes in the water, with soap that poisons it. Last year many big fish died, we were told. There are more tobacco farms along the river upstream of the Park.

After a hot walk back along the dry road, we got back to camp to find there was no water. There were eleven of us, nine other guests and thirty in the conference. The other visitors left immediately. Sydney walked a great distance to fetch water from a hole dug in the ground near the village, which we boiled and treated with tablets. He had seen elephants round the corner so putting our bread and cake-making on hold, we ran to watch. When Lewis arrived as arranged, we took the vehicle closer to the herd of thirteen and spent a happy two hours as close as was safe. Lewis carefully read every elephant movement and instructed us accordingly. A dozen lesser flamingos floated into the same picture, what a sight!

Our last night party was a great success, with Sydney and Richard doing a brilliant dance, "The Vizumba" or Witch doctor, with a costume made from rattling burnt cans, cardboard and feathers and faces painted white with flour.

A VERY GOOD MEETING



Our busy team clocked through the tasks and were ready on time at 8.30am, all except the photos and farewell speeches of thanks and appreciation. At the timber yard, we met Heatherwick, the Vwaza manager and scientific officer, Messrs. Ndhlamin and Kataya. It was a very useful discussion, giving immediate feedback to the Parks Authorities on where more anti-poaching action is needed, better protection of the water quality at Vwaza, new discoveries and helping us see where more back-up of research information was needed. Bracken, bats in houses and protection of the water quality need further work. More speeches and gifts were exchanged, with many good wishes for a successful future.

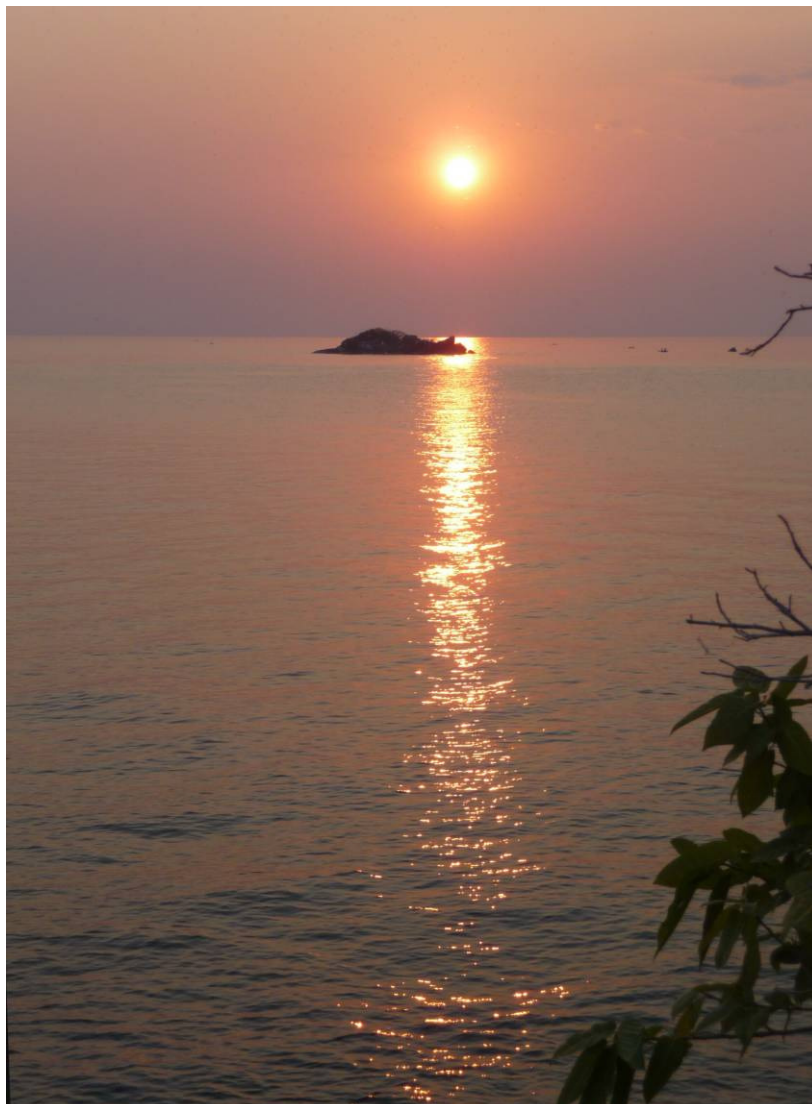
PARADISE

Excellent accommodation on a lovely beach, good food, good company, sunbathing, walking and swimming characterised our two night break on Lake Malawi. Kit spent all day chatting in the village, guided by a local young lady. Tim settled himself carefully and waited

for wildlife to come to him, with rich rewards. A huge monitor lizard basked a few feet away. I clambered along the rocks to the headland and found myself sharing a very narrow, rocky ledge with a very large snake. Shaun later managed to identify it from my shaky photograph as a Sand snake. Two otter holts were evident, one nearby and a family one with a play porch of flattened grass just round the headland. In the evening we set ourselves an "Otter watch" and sure enough an otter, Sarah's special animal, came hunting along the rocky edge of the bay and settled very close to us.

Local dancers came in the evening and some of us joined in at the end. Supper was excellent as usual followed by presentations of thanks and appreciation to the team. After the celebrations we did some night spotting of fish.

By 8.30am, Joe had returned from his day off in the next village and finished his negotiations on a long string of good-sized, bright blue Lake Fish at 100 kwacha each. It seemed a long steady drive back to Lilongwe, on tarmac for a change and arriving at 3pm at the Korea Garden Lodge, this time with no customers at all! We enjoyed the Saturday night at Dom Brione's restaurant for dinner; with the added very unusual luxury of having the restaurant all to ourselves.



Sunrise from our beds at the lake of stars

Marianne Overton

SCHOOL CHALLENGE

C. Peter Overton

I flew out to Malawi a week ahead of the Biosearch team. This year we had been asked to assist with a group of 16 year old students to give them a nine day trek across the Nyika as part of a broader package of self development. Their original plan to go to Madagascar had been thwarted by Foreign Office advice following political disturbances there. So in May I had discussions with the organisers as to how we could create a challenge for them in Malawi. Trekking across the Nyika and down the eastern escarpment but not following the more familiar Livingstonia trail, seemed to be the answer. Since we were there with our Biosearch group it required some difficult vehicle management to satisfy the two groups simultaneously but it worked out fine, with careful programme planning and a little flexibility.



Heading into the Park

Peter Overton

The group was set on their way, accompanied by scouts Daniel Zygambo, Grandson Simkoko and Hassan Mamudo. Arrangements at Thazima were sorted out with Obed Mkandawire and Heatherwick Msiska on my exit from the park. This was a considerable bonus since in the past we have had to fit these meetings in with the arrival of the Biosearch group, which can be tricky to accommodate to time. This meant we could take the team straight to their bush camp and avoid an overnight stop at Thazima. Two days later I was on my way back to Lilongwe, via Ray Murphy's house near Mzuzu,

where we store hardware. It was an overnight stop which was useful to plan Ray's participation in the expedition. He was also able to provide vehicle cover for four nights during the period of changeover of vehicles, when the bus had to travel back to Lilongwe via Nkhata Bay to collect the school group and prior to the arrival of the Land Rover for the next phase of the expedition to Vwaza.

After I had settle our Biosearch team into their first camp at Vitinthiza, the group needed to be collected from Njalayankhunda at the Wovwe hydroelectric station and taken round to Vwaza. This is a five hour trip from our Luselo camp and we were somewhat delayed on departure because of a thick layer of ice on the bus windscreen at 5.30 am. Perhaps this was a new experience for our driver since Jo started to use a stick little bigger than a toothpick to clear it, before I intervened with my credit card. It was surprisingly cold at 6000ft and at our old and much used Nganda base camp, 1400ft higher, it must have been very bitter indeed.

The two of us were ready for breakfast by the time we arrived at Rumphu but we were not prepared for the next event. We were stopped by a police unit with a mobile speed camera. There was absolutely no indication of a speed restriction but they demonstrated that we were in fact doing 56 kph in a 50 kph restricted area. We were running a little late so we paid the 5000 kwacha fine and made to leave straight away. However, the process of receipts and rubber stamping took a little longer so there was a further delay before we could continue on our way.

The school team were waiting on the roadside near Njalayankhunda, enjoying some refreshments at a small hut. They had had an adventurous time in foggy conditions and survived getting lost on the odd occasion, despite having good leadership. Progressing to the scout camp to pick up Hassan Mamudo gave me the opportunity of meeting with Jonas Luhanga again. We worked together last in 2006 on the escarpment above the Wovwe reservoir and he was also one of our escorts in the 1996 recce of the Mondwe area, prior to

the launch of our 1997 expedition. The trip back to Rumphu took two hours. Here we retrieved our trailer from the police depot, where we had left it 48 hours earlier. They very kindly agreed to secure it in their compound without charge and this saved us hauling it some distance up to Luselo and back via Njalayankhunda. It was a favour for which we are very grateful.

The group appreciated their chicken and chips lunch in Rumphu, before travelling on to Vwaza, arriving later than planned but in plenty of time to set up camp. I stayed the night at Hut 2, which is usually reserved for visiting staff. It had two beds but Jo, our driver, refused my offer to share, preferring to remain in the bus, as he would do throughout. He said he was warm and comfortable and maybe he was. He did at least have his own private room. The bus trapped heat from the sun during the day and seemed to retain it overnight. Certainly it could not have been colder than our first nights camping at 6000 ft. Even Vwaza was exceptionally cool for the season. I gave the school team my health and safety lecture on the bus, emphasising the risk of tsetse flies and mosquitoes, not to mention Hippos and Elephants. As I stepped out and felt the breeze and temperature, I realised that they were unlikely to be much troubled, although in the event two individuals did get bitten by tsetse during their stay. Sadly, because there was an earth grader working on the track near the camp, the elephants kept away and the only sighting was a single rear view in the bush.



Joe at the wheel

Kit Clayton

I left them the following morning, having first given them the bus for a game drive in Vwaza. The trailer remained there for two nights, while we relocated the Biosearch team to Chisanga, until Jo returned to Vwaza to collect the school group and take them on the next phase of their trip near Ekwendeni and on to Nkhata Bay for an R&R period on the lakeshore. Ten days later I was returning with the bus to give the group their exit down to Lilongwe.

After some years suffering various problems with the buses, principally with broken springs, this year proved no different. One minor breakage was corrected in Lilongwe after the initial visit to the Nyika. On the return journey with the school group we approached Lilongwe on the Salima road up the steep escarpment. We were to get a final reminder of the fallibility of these Mitsubishi Rosa buses. A fractured water hose, which was not readily fixed on the roadside, despite the attempted application of duck tape, caused several stoppages to top up the radiator. Our back up bus, ordered from the start got lost. We did eventually get into Lilongwe unaided about two hours later than scheduled. I suppose it added further adventure to the experience of 16 year olds who had come to Africa to see a different world.

REFLECTIONS

As I reflected on the 2009 expedition, somewhere lost in the remote Mwenembwe Forest on the eastern escarpment of the Nyika, whilst I was at Lilongwe International Airport. Joe, our expedition driver, was heading up the M1 to Rumphu and tomorrow to Nyika, where he would be reunited with our lonely trailer, one hour out of Chilinda on the Juniper Forest track. He was driving a ten-seater Land rover, which I had finally wrestled from the hire company yesterday morning, after much confusion and the addition of a set of credible tyres and an essential tow-hitch. A more substantial vehicle you might think but years of experience has taught us that the Nyika roads can wreak havoc with any vehicle, no matter how robust. It is all part of the African experience to expect delays caused by vehicle break down.



MEDICAL NOTES

Marianne Overton

Our diligent efforts at good hygiene did pay off, as we had very few problems. We also successfully avoided serious problems of heat exhaustion and dehydration. We were diligent with boiling water to avoid problems and always sterilising our drinking water with tablets. The normal water source at Vwaza ran out and after walking several kilometres, some water was obtained from a source used by the village, but its quality was unknown. This is an exceptional case, where the boiled water would have benefited from tablets as well.

- July 26th Two people with sniffles two days after arriving, which lasted a week.
- July 31st Two people with blisters one day, from going downhill too long!
- Aug 3rd Two people with cut fingers, one on grass and one with a knife whilst cutting vegetables.
- Aug 2nd & 3rd All had a rash after Chisanga Forest Day, on the exposed parts of the body. A good wash at the end of each day is advised!
- August 5th One individual had stomach cramps and diarrhoea overnight; self-treated successfully.
- August 12th One person had to suffer a morning in camp after twisting an ankle.
- August 18th One case of stomach cramps at Vwaza. Gave diarolite. After our return to the UK, this was identified as Giardia and treated successfully.

All in all, we were remarkably healthy throughout the expedition. We all got a lot fitter; with good food, good company and exercise in the open air all day. We mentioned the risks of drinking lake water near Chinteche, which may have a high biological impurity and this year everyone maintained their their level of health successfully.



Ben relaxing at camp – practise made perfect

Sarah Sandon



Living in Africa
Tim Wayman



PROVISIONS

Peter Overton



PURCHASING

We completely revised the provisioning list for 2009 to illustrate realistic requirements for our particular team size. With the planned itinerary giving us access to basic food supplies (the vehicle passed through Rumphi and Bolero during the course of the expedition) it was possible to plan provisions more precisely with less requirement for contingency stocks than if we had, for example, spent the entire period in the northern valleys of the Nyika National Park or at Uledi in the north. With the costs and risks to the vehicle of unnecessary movements it is always best to overshoot a little since any surplus stocks are given away to the scouts and their families at the end. However, we are equally concerned that no food should be wasted. This is a matter of good stock management and having someone in charge of menus to make sure that perishable supplies, especially, are used up at the correct time – even if it involves a heavily laden tomato stew at some stage!

The following key points may be of help to anyone planning an expedition to the Nyika:

It is easier to purchase most supplies, other than fresh items, from a single source in Lilongwe before departure. We used Shoprite in the centre of Old Town.

This is not the cheapest source of stock; tinned imported products are especially expensive. However, for bush trekking tinned fish, one of the higher cost items, is particularly useful due to its light weight and energy richness. Time is often a factor pre-expedition and searching round town for different items is rather impractical with only a day to get things together.

All fresh fruit and vegetables can be obtained from the street market; the quality, availability and price is good here.

Good quality fresh meat for the first three days of the expedition can be ordered in advance and the supplier will keep it in a fridge for collection on departure day. When obtainable, it is

a good idea to take some vacuum packed meat, which can be brought out as a treat after the first forays, since it will keep well in a cold box kept cool under a streamside tree.

The best meals are always made from fresh ingredients, which also happen to make a much cheaper menu so there is little point in bringing more convenience packs than can be usefully employed for the trekking phases of the expedition.

Milk powder, maize flour, porridge oats, rice, sugar, tea, dried fish, potatoes, tomatoes, onions, dried beans, cabbages and carrots, cooking oil and various flavourings are the key ingredients to provide an interesting and nutritious menu for the three weeks. Fresh fruit in the form of oranges or grapefruits, which keep well, or the ubiquitous banana should be added. Hard boiled eggs are one of the most useful of fast foods and a stock of fresh eggs will last the duration of the expedition. We find we usually share our preferred menus as the expedition progresses and the nsima (maize flour) and dried fish are the only ingredients which seem to be rather culturally exclusive to the game scouts.

'Snack foods' as the scouts rightly describe some items, serve mainly to get salt into the system and have limited energy value when a day's trekking is in store. Although weight is an issue, it is quite normal to throw the odd onion or potato into one's pack when leaving on a five day trek; it means much more than a chocolate bar at the end of the day!

It is rare for us to run short of food but there are some items, which if they are missing can give that impression. Cooking oil, salt and tea have on occasion given us cause for concern but fortunately these are all items that can be obtained from roadside huts in the remoter areas. The scouts, on their 15 day duty patrols manage very well on nsima and dried beans, with tea and plenty of sugar for support so it is important not to get too carried away with what is 'necessary'. Over the years we find the quality of our meals has gone up as we have focused more on the basics and found interesting ways of preparing them.

LIST OF PROVISIONS

The following list is an allowance for 10 team members and three scouts (the scouts are split off from the rest of the team since their dietary requirements need to be considered separately. We added to this list some top-ups with a few fresh items when the opportunity presented itself. These items included fresh bread and tomatoes. Additions to the initial basic stock purchases, which were made because we did not feel the need for much contingency this year, have been included in the full list for completeness. It is very difficult to calculate exactly what any particular expedition will eat, with varying appetites and a few food preferences, so if we felt we would be unable to do any re-provisioning we would normally add at least 15% to the quantities bought.

PROVISIONS LIST

Apples	60
Avocados	20
*Bananas	50
Cabbages	15 large
Carrots	10 kg
Cornflakes	2 x 1kg
Grapefruit	20
Green beans	5 kg
Green peppers	10
Papaya	2
Pineapples	4
Baked beans	30 tins
Biscuits (sweet)	2 packs x2 kg
Bread	6 loaves
Bread Rolls	40
Cooking oil	10 litres
Cheese - cheddar	20 pks x 400g
Chocolate drink - Milo	6 x 500g tins
Coffee	1 x 500g
Instant custard powder	10 packs
Eggs	90
Fish –kapenta dried	3 kg
Fish – from market	5 kg
Flour for bread	2 x 2.5kg
Fruit – dried mixed	10 x 500g
Fruit cocktail	20 tins
Herb mixture	2 small pots
Orange squash	10 x 2l bottles
Juice - grenadilla	5 litres
Juice – guava	5 litres
Macaroni	5 x 500g pks
Maize flour	6 x 5 kg
Margarine	4 x 500g tubs
Marsh Mallows	3 packs
Matches	1 x 6 box
Meatballs in gravy	8 tins
Milk – liquid sterilised	24 litres
Milk powder – NIDO	2 x 900g tubs
Onions	10 kg
Orange squash-Sobo	8 x 2l bottles
Oranges	5 kg
Peanut butter	15 pots
Peanuts	1kg
Processed Peas	12 x 400g can
Pepper	1 x 100ml pot
Porridge oats - Jungle	10 x 1kg bags
Potato dried	10 packs
Potatoes	25kg
Potatoes -sweet	5 kg
Provita biscuits	7 packs
Rice	3 x 5kg bags
Rusks	14 x 500g box
Salt	2 x 500g
Sardines/tom	15 tins
Sauce - Bolognese	5 packs
Sauce - Cheese	5 packs
Sauce - Pepper	5 packs

Sauce - Peri Peri/chilli	1 bottle
Sauce - Sweet & sour	5 packs
Sauce – white	5 packs
Soya – tomato & onion	6 packs
Spaghetti	7x500g packs
Steak – Fillet	3 kg
Steak –vacuum sealed	3 kg
Sugar - brown	2 kg
Sugar – white	16x 1kg
Sweets	10 packs
Tea Bags	240 bags
Tomato Sauce	1 bottle
Toilet rolls	30
Tomatoes	10 kg
Tuna	20 x 170g tins
Usavi mix – Royco	
W/U liquid	1 x 1.5l
Yeast dried	1 pot
Water in bottles	50 x 0.5 litre

Hardware

Item	Quantity
Candles	4
Bowl plastic large red	1
Bowl plastic large blue	1
Bowl plastic small red	1
Bucket – green plastic	1
Bucket – red plastic	1
Grill /Mesh for fire	1
Trays – plastic	3
Machetes	3
Hoe	1
Ladle	1
Large platters	1
Birthday candles	1 box
Cheese Grater	1
Tinfoil	1
Chopping boards	2
Sharp vegetable knives	3
Food bags reseal	1 pack/pers
Fish slice	1
Frying Pan	1
Insulated box	1
Potato Peeler	2
Tea strainer	1
Colander spoon	1
Omo powder	2 x 1kg
Pan scrubber	20 pack
Nest of Cooking pans	1x6
Mosquito net	1
Fire gloves	2 pr
AA batteries	Pack of 20
AAA batteries	4x2
Disinfectant - Dettol	1
Refuse Bin Liners	1 roll
Wire wool for pans	8
Bucket – 5 gallon	1
Base camp tin opener	1
Potato Masher	1



Markets

Left: Tim Wayman

*Right: Buying charcoal en route to Lake shore
Fishermen rowing home at dawn Marianne Overton*

BIRD REPORT

Peter Overton and Richard Nyirenda

SUMMARY

Over recent years bird reports have been presented in the Biosearch Expedition report sporadically, depending on the available expertise. In 2007 and 2008 both authors were actively working together in the three week period to make a checklist of birds in the two areas of the expedition; that is in the Nyika National Park, mostly from the 6000 ft to the 7500 ft contour and Vwaza Marsh Game Reserve in both the northern and southern parts between 3500 ft and 4000 ft. In 2009 the authors were able to



Red-winged Francolin *Marianne Overton*

work together for a more limited period because of the logistical requirements of the expedition. Bird identification and observation was therefore compromised to some extent. We covered Vithiza, Chisanga, Juniper Forest, Kasaramba and Mwenembwe Forest areas but collected few records from Vwaza since Peter had left the expedition at that point. To create some continuity and comparability Table 1 shows the 2009 observations alongside the previous two years. Also, with the growth of interest in bird mapping for conservation and tourism reasons, we have made a start on introducing map references for our sightings, where possible as in Table 1.

We had four records of species, excluded from the table, which have not previously been recorded inside the Nyika National Park. Two of these have been rejected on grounds of unsuitable habitat or lack of clarity over identification. Of the remaining two, the European Turtle Dove recorded at Chilinda is more likely to have been a Pink Breasted Turtle Dove *Streptopelida lugens*. The Chilinda habitat and altitude does not favour the common African small doves, most of which we found in *Brachystegia* or lowland marsh areas.

The Chorister Robin *Cossypha dichroa* deserves closer consideration. It was seen in good light over a period of some 15 minutes by both Richard and Peter, working together. At the time we discounted possible confusion with White Starred Robin and White Browed Robin. We saw it in suitable montane forest habitat at 6000 ft near Chisanga Falls. However it was clearly well out of its known range in South Africa. Without detailed field notes we cannot put this forward as a confirmed new species at this stage, but it should be looked out for by any future bird trips to the Chisanga area.

We found yet again this year that the number of birds at the higher altitudes where we were trekking was low at this season, or at least they were not visibly evident. With low cloud conditions at times it is inevitable that sightings would be reduced. However, the Nyika does offer some interesting species that are absent from other areas and will always attract the bird watcher for this reason. A system of annual numerical recording for the commoner species would have great long term value in monitoring the conservation condition of the park. Denham's Bustard *Neotis denhami* for example nests in the dry season when burning takes place and known territories should be protected. The Nyika Lark, Grassveldt Pipit, Quail and Francolins are all relatively easy to monitor with linear counts along the tracks and could be valuable indicator species for the plateau grassland habitat. None of them are under poacher pressure so they could



Swallow-tailed Bee-eater, at Kawiya *Marianne Overton*

give some indication as to whether other environmental changes might be influencing larger mammal populations on the higher parts of the Park.

METHOD

All observations were done on an opportunistic or random basis, tying in with the large mammal survey and forest tree research work. This meant that observations were made throughout the day and unfortunately there was no special emphasis on the best time for observation, which is between 6 and 8 am for many species. The forests were rather quiet but the records of species identified in each of them have also been entered in the appropriate vegetation report. The two authors worked together where practical but had to split up for logistical reasons from time to time. Peter left the expedition once the team set off to Mwenembwe Forest and was therefore absent for that and the Vwaza period also.



Pied Kingfishers

Tim Wayman



Green backed Heron

Marianne Overton



Guinea Fowl and Elephant droppings at Vwaza

Marianne Overton

CHECKLIST OF BIRDS RECORDED

Key

Four figure map references (bottom left hand of square) are taken from the appropriate 1:50 000 maps Nganda 1033B4; Vintithiza 1033D1; Katumbi 1033D3; Chilinda 1033D2; Muhuju 1033D4; Vwaza 1033C4 and Lake Kasuni 1133B1.

Where a reference is approximate due to lack of precision data it is indicated in *italics*. In these cases it is likely to be fairly accurate on a 2 x 2 km square (tetrad) basis.

+ Records with no accurate location recorded *or* found at multiple sites within the relevant parks.
 BOM Birds of Malawi number; where indicated in bold this species was recorded only in 2009. This useful supplement book to the Newman’s Birds of Southern Africa is now out of print and copies are becoming hard to obtain.

Table 1 A checklist of birds recorded on the expeditions with locations 2007-2009

Common name	Species name	BOM	Nyika 2007	Vwaza 2007	Vwaza 2008	Nyika 2008	Nyika 2009
Dabchick	<i>Tachybaptus ruficollis</i>	1				+	+
Little Egret	<i>Egretta garzetta</i>	19			7068	7217	
Grey Heron	<i>Ardea cinerea</i>	20		7068	7068		
Black-Headed Heron	<i>Ardea melanocephala</i>	21		7068			
Hamerkop	<i>Scopus umbretta</i>	24	8142		7068		
Yellow billed Stork	<i>Mycteria ibis</i>	32			7068		
Sacred Ibis	<i>Threskiornis aethiopicus</i>	33			7068		
Hadeda Ibis	<i>Bostrychia hagedash</i>	34		7068			
Glossy Ibis	<i>Plegadis falcinellus</i>	35			7068		
Whitefaced Duck	<i>Dendrocygna viduata</i>	40		7068			
Egyptian Goose	<i>Alopochen aegyptiacus</i>	41			7068		
Knob billed Duck	<i>Sarkidiornis melanotos</i>	43			7068		
Yellow-Billed Duck	<i>Anas undulata</i>	46				+	+
Lappet-Faced Vulture	<i>Torgos tracheliotus</i>	55	8142 9146				
White-Backed Vulture	<i>Gyps africanus</i>	57	8142			+	
Gymnogene	<i>Polyboroides typus</i>	63		7068			
Bataleur	<i>Terathropius ecaudatus</i>	64			5695		
Brown Snake Eagle	<i>Circaetus cinereus</i>	66				+	0712
African Goshawk	<i>Accipiter tachiro</i>	71				+	
Little Sparrowhawk	<i>Accipiter minullus</i>	73	8142				
Gabar Goshawk	<i>Micronisus gabar</i>	75				+	
Augur Buzzard	<i>Buteo augur</i>	77	9146 8830				0712
Steppe Buzzard	<i>Buteo buteo</i>	78			5695		
Long crested Eagle	<i>Lophaetus occipitalis</i>	79				+	0712
Martial Eagle	<i>Polemaetus bellicosus</i>	81	7535		5695		7433
Lesser Spotted Eagle	<i>Aquila pomarina</i>	88			7068		
African Fish Eagle	<i>Haliaeetus vocifer</i>	90		7068	7068		
Yellow Billed Kite	<i>Milvus migrans parasitus</i>	91	7631			7217	7336
Black Kite	<i>Milvus migrans migrans</i>	91			7068		
Black Shouldered Kite	<i>Elanus caeruleus</i>	94	9146			7118	+
Bat Hawk	<i>Macheiramphus</i>	95				+	
Lanner Falcon	<i>Falco biamicus</i>	97				7414	
Red necked Falcon	<i>Falco chicquera</i>	101			4792		
Dickinson's Kestrel	<i>Falco dickinsoni</i>	102				7118	
Rock Kestrel	<i>Falco tinnunculus</i>	106	9146			+	7635
Shelley's Francolin	<i>Francolinus shelleyi</i>	109			5695		+
Red-Winged Francolin	<i>Francolinus levallantii</i>	110	9146			+	0712
Red necked Francolin	<i>Francolinus afer</i>	112			5695		
Common Quail	<i>Coturnix coturnix</i>	115	+	7068		+	+
Helmeted Guineafowl	<i>Numida meleagris</i>	118		7068	5695 7068	7412	
Black Crane	<i>Amaurornis flavirostris</i>	130				7412	7315
Denham's Bustard (Stanley's)	<i>Neotis denhami</i>	141	8142 8830 9146			+	7217

Common name	Species name	BOM	Nyika 2007	Vwaza 2007	Vwaza 2008	Nyika 2008	Nyika 2009
Blacksmith Plover	<i>Vanellus armatus</i>	146		7068	7068		
Crowned Plover	<i>Vanellus coronatus</i>	148			5695		
Wattled Plover	<i>Vanellus senegallus</i>	150			7068		
Three banded Plover	<i>Charadrius tricollaris</i>	153			7068		
Killitz's Plover	<i>Charadrius pecuarius</i>	154			7068		
Greenshank	<i>Tringa nebularia</i>	161		7068	7068		
Common Sandpiper	<i>Tringa hypoleucos</i>	165		7068	7068	7414	
Little Stint	<i>Calidris minuta</i>	174			7068		
Black Winged Stilt	<i>Himantopus himantopus</i>	178		7068	7068		
Water Dikkop	<i>Burhinus vermiculatus</i>	181		7068	7068		
Temminck's Courser	<i>Cursorius temminckii</i>	182				+	
Redwinged Pratincole	<i>Glareola pratincola</i>	184		7068	7068		
Rameron Pigeon	<i>Columba arquatrix</i>	194	7631			+	0712
Red Eyed Dove	<i>Streptopelia semitorquata</i>	197			7068		
Cape Turtle Dove	<i>Streptopelia capicola</i>	199		7068	7068	+	
Laughing Dove	<i>Streptopelia senegalensis</i>	200			7068		
Blue Spotted Wood Dove	<i>Turtur afer</i>	203		7068	7068		
Green Spotted Wood-Dove	<i>Turtur chalcospilos</i>	204		7068	7068		
Green Pigeon	<i>Treron calva</i>	206			+		
Meyer's Parrot	<i>Poicephalus meyeri</i>	209			5695		
Schalow's Lourie	<i>Tauraco schalowi</i>	211	8142				0819
Purple-Crested Lourie	<i>Tauraco porphyreolophus</i>	212	9146		5695	+	+
Grey Lourie	<i>Corythoides concolor</i>	213		7068	5695		
Burchell's Coucal	<i>Centropus burchellii</i>	231		7068	5695		
Scop's Owl	<i>Otus senegalensis</i>	234		7068			
White faced Owl	<i>Otus leucotis</i>	235				7217	
Verreaux's Eagle-Owl	<i>Bubo lacteus</i>	238		7068	7068		
Marsh Owl	<i>Asio capensis</i>	243	9346			7118	
Fiery necked Nightjar	<i>Caprimulgus pectoralis</i>	245			5695		
Mountain Nightjar	<i>Caprimulgus poliocephalus</i>	246	9146			7217	0712
Freckled Nightjar	<i>Caprimulgus tristigma</i>	247				+	
Palm Swift	<i>Cypsiurus parvus</i>	253	7535	7068	7068		
White rumped Swift	<i>Afus caffer</i>	260	7631				
Speckled Mousebird	<i>Colius striatus</i>	261	9146	7068		+	9809
Bartailed Trogon	<i>Apaloderma vittatum</i>	264				+	
Giant Kingfisher	<i>Ceryle maxima</i>	265	+			7412	
Pied Kingfisher	<i>Ceryle rudis</i>	266			7068	+	
Malachite Kingfisher	<i>Alcedo cristata</i>	268					
Woodland Kingfisher	<i>Halcyon senegalensis</i>	270				+	7535
Striped Kingfisher	<i>Halcyon chelicuti</i>	271			5695		
Brown Hooded Kingfisher	<i>Halcyon albiventris</i>	272	7631				
Little Bee-eater	<i>Merops pucillius</i>	278			7068	+	
Swallow-tailed Bee-eater	<i>Merops hirundineus</i>	280			5695		
Lilacbreasted Roller	<i>Coracias cordata</i>	282			7068		
Hoopoe	<i>Upupa africana</i>	286	7631 6503	7068	7068	+	
Red Billed Woodhoopoe	<i>Phoeniculus purpureus</i>	287		7068	7068		

Common name	Species name	BOM	Nyika 2007	Vwaza 2007	Vwaza 2008	Nyika 2008	Nyika 2009
Scimitar-billed Woodhoopoe	<i>Phoeniculus cyanomelas</i>	288			7068		
Grey Hornbill	<i>Tockus nasutus</i>	289	8142	7068	7068		
Yellow Billed Hornbill	<i>Tockus flavirostris</i>	291			7068	+	
Crowned Hornbill	<i>Tockus alboterminatus</i>	293					7535
Trumpeter Hornbill	<i>Bycanistes bucinator</i>	294			5695		
Ground Hornbill	<i>Bucorvus leadbeateri</i>	296					Vwaza
Black-collared Barbet	<i>Lybius minor</i>	299			5695		
Greater Honeyguide	<i>Indicator indicator</i>	310			5695	+	
Bennett's Woodpecker	<i>Campethera bennetti</i>	316			5695		
Rufous-naped Lark	<i>Mirafra africana</i>	325	+				
			8946				
Angola Swallow	<i>Hirundo angolensis</i>	335	7631				
Blue Swallow	<i>Hirundo atrocaerulea</i>	336					0712
Wire-tailed Swallow	<i>Hirundo smithii</i>	337		7068	7068		
Red-rumped Swallow	<i>Hirundo daurica</i>	342	8142				
Greater Striped Swallow	<i>Hirundo cucullata</i>	343					0712
Grey-rumped Swallow	<i>Pseudhirundo griseopyga</i>	345				+	
Rock Martin	<i>Hirundo fuligula</i>	346	8142				
Eastern Saw-wing	<i>Psalidoprocne pristoptera</i>	348	8946				
Black Saw-wing	<i>Psalidoprocne holomelas</i>	348		7068	7068		
Fork-tailed Drongo	<i>Dicrurus adsimilis</i>	352		7068	7068	+	
Black-headed Oriole	<i>Oriolus larvatus</i>	355		7068	7068	+	7535
Pied Crow	<i>Corvus albus</i>	357					+
White-necked Raven	<i>Corvus albicollis</i>	358	+	7068		+	+
Southern Black Tit	<i>Parus niger</i>	360			5695		
Arrow-marked Babbler	<i>Turdoides jadineii</i>	367			7068		
Black-eyed Bulbul	<i>Pycnonotus tricolor</i>	371	+	7068	7068	+	+
Olive-breasted Mountain Bulbul	<i>Andropadus tephrolaemus</i>	374	8142 7631				9809 9910
Common Stonechat	<i>Saxicola torquata</i>	384	+			+	+
Arnot's Chat	<i>Thamnotaea arnoti</i> <i>Thamnotaea</i>	388				+	
Mocking Chat	<i>cinnemomeiventris</i>	389					+
Starred Robin	<i>Pogonostichla stellata</i>						9910
Heuglins's Robin	<i>Cossypha heuglini</i>	403				+	+
Kurrichane Thrush	<i>Turdus libonyanus</i>	407	7631			+	+
Yellow Warbler	<i>Chloropeta natalensis</i>	423					7535
Mountain Warbler	<i>Chloropeta similis</i>	424					+
Tawny-flanked Prinia	<i>Prinia subflava</i>	434			+		
							9809
Bleating Bush Warbler	<i>Cameroptera brachyura</i>	442				+	9910
Stierling's Barred Warbler	<i>Cameroptera sterlingi</i>	443				+	+
Green-capped Eremomela	<i>Eremomela scotops</i>	446				+	
Mountain Cisticola	<i>Cisticola nigriloris</i>	456	+			+	9809
Ayre's Cisticola	<i>Cisticola ayresii</i>	467	9146				
Ashy Flycatcher	<i>Muscicapa coerulescens</i>	471	7631		+		
Fantailed Flycatcher	<i>Myioparus plumbeus</i>	473				+	7635
Cape Batis	<i>Batis capensis</i>	478					+

Common name	Species name	BOM	Nyika 2007	Vwaza 2007	Vwaza 2008	Nyika 2008	Nyika 2009
Chin-spot Batis	<i>Batis molitor</i>	479	8142 7631		+		
White-tailed Flycatcher	<i>Trochocercus albonotatus</i>	486					0712
Puffback	<i>Dryoscopus cubla</i>	489				+	
Black-Headed Tchagra	<i>Tchagra senegala</i>	492	8142 7631	7068	+	+	
Southern Boubou	<i>Laniarius ferrugineus</i>	493	8142 7631	7068		+	
Grey-headed Bush Shrike	<i>Melaconotus blanchoti</i>	498	8142	V		+	
African Pied Wagtail	<i>Motacilla aguimp</i>	503		V	7068		
Grassveld Pipit	<i>Anthus cinnamomeus</i>	505	8142 7631	V		+	
Fiscal Shrike	<i>Lanius collaris</i>	517		V		+	
White Helmet Shrike	<i>Prionops plumatus</i>	519				+	
Red-billed Helmet Shrike	<i>Prionops retzii</i>	520				+	
Waller's Redwinged Starling	<i>Onychognathus walleri</i>	521	7631				
Redwinged Starling	<i>Onchognathus morio</i>	522				+	
Slender-billed Redwinged Starling	<i>Onchognathus tenuirostris</i>	523					9810
Lesser Blue Eared Glossy Starling	<i>Lamprotornis chloropterus</i>	524		V			
Greater Glossy Blue-eared Starling	<i>Lamprotornis chalybaeus</i>	525			V		
Yellow-billed Oxpecker	<i>Buphagus africanus</i>	530			V		
Olive Sunbird	<i>Nectarinia olivacea</i>	535				+	
Black Sunbird	<i>Nectarinia amethystina</i>	537				+	
Yellow-bellied Sunbird	<i>Nectarinia venusta</i>	540					7635
Greater Double Collared Sunbird	<i>Nectarinia afra</i>	541	+			+	
Lesser/Eastern Double Collared Sunbird	<i>Nectarinia chalybea/mediocris</i>	543					9910
Red-tufted Malachite Sunbird	<i>Nectarinia johnstoni</i>	548					9809 9910
Bronze Sunbird	<i>Nectarinia kilimensis</i>	549	+			+	
African Yellow White-eye	<i>Zosterops senegalensis</i>	550	7631			+	7535
Red-billed Quelea	<i>Quelea quelea</i>	566			7068		
Yellow-rumped Widow	<i>Euplectes capensis</i>	569			+		
Mountain Marsh Widow (Whydah)	<i>Euplectes psammocromius</i>	572	8142 9146			+	+
House Sparrow	<i>Passer domesticus</i>	578				Bolero	
African Firefinch	<i>Lagonosticta rubricata</i>	594	7631				
Jameson's Firefinch	<i>Lagonosticta rhodopareia</i>	595				+	6707
Blue Waxbill	<i>Uraeginthus angolensis</i>	596			7068		
East African Sweet Waxbill	<i>Estrilda quartinia</i>	598					+
Common Waxbill	<i>Estrilda astrild</i>	600				+	
Rock Bunting	<i>Emberiza tahapisi</i>	610				+	
Yellow-eyed Canary	<i>Serinus mozambicus</i>	612		7068	7068		+
Bully Canary	<i>Serinus sulphuratus</i>	614				7118	

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White-necked Raven

Tim Wayman

DISTRIBUTION OF REPTILES AND AMPHIBIANS

Shaun M. Allingham

ABSTRACT

Reptile and amphibian distribution and abundance patterns are linked with environmental factors that determine habitats on a macro scale. This report describes patterns of diversity and species composition across major habitat types. Using visual encounter surveys, pitfall traps and random quadrats, 14 species of amphibian and 13 species of reptiles were recorded. Macrohabitat results reveal a clear ecological stratification between species. Reptile species richness was significantly higher in grasslands and amphibian species richness was significantly higher in wetland. These conclusions emphasize the importance of long term sampling and biodiversity studies. The relatively poor focus on herpetological research in Malawi is out of proportion to its substantial ecological and conservation importance.

Keywords: environmental factors; species composition; patterns of diversity; biodiversity.

INTRODUCTION

The herpetofauna of northern Malawi remains one of the most poorly known in Africa. This is a consequence of the inaccessibility of the area. Boulenger (1897) and Loveridge (1948) were amongst the first to document species in the area. Despite the richness of the Nyika National Park, ecological research lags far behind more charismatic fauna such as birds and mammals. Herpetofauna are known to be sensitive to habitat modification (Knapp, 2005), despite this there remains a lack of study on reptiles and amphibians. This is a cause for concern because of the widespread use of fire as a conservation management tool and its impact on herpetofauna (Masteron, 2008).

Amphibian populations have experienced catastrophic declines across many parts of the world within the last few decades (Semlitsch 2003, Lips *et al.* 2005a). According to recent global assessments 43.8% of amphibian species were found to be experiencing some form of population decrease, greater than declines in both birds and mammals (Stuart *et al.* 2004). The assessment is likely to be an under-estimation of the problem, as 22% of species are data deficient in Africa. The lack of data on distribution of amphibians makes it hard to determine if populations are declining (Stuart *et al.* 2004). In the light of this, it is important to determine baseline patterns of diversity and habitat preferences in areas which still retain intact habitats. Such data is necessary to monitor population declines and evaluate the impact of conservation. Planning conservation strategies are hampered by poor knowledge of the organisms in question (Green, 2003). Documenting the occurrence of individuals at specific sites is invaluable to better understand species ecology, which, in turn aids conservation (Green, 2003).

There is paucity on afro-montane herpetofauna and communities, owing to bio-geographic bias towards studies in subtropical and temperate regions. Studies that do focus on habitat use are further biased towards tropical wet forests (e.g. Crump 1971, Inger & Colwell 1977, Duellman 1978). Little data is available for African ecosystems, with most data focusing on tropical forests (Vonesh, 2001), with an absence of data on afro-montane grassland. Despite the lack of attention this biome is globally important wilderness and worthy of conservation (Mittermeier *et al.* 2003).

Understanding of the taxonomy and ecology of Malawi herpetofauna is poor (Howell 2000, Mazibuko *et al.* 2004), as is evident by the lack of new reports. Studies that have been conducted have been restricted geographical summaries (e.g. Mazibuko *et al.* 2004, Channing 2001) and information describing spatial patterns of species is scarce for Malawi.

This study describes species composition and relative abundance across major habitat types characteristic of the study area (woodland, riverine, grassland and wetland) as well as serving as a baseline for continued monitoring of this important national park.

STUDY SITE

The Nyika plateau occupies an area between latitude 10° S and 11° S, and longitude 33° E and 34° E in the northern part of Malawi (Fig. 1). The plateau is remnant of an uplifted block created by tectonic activity that formed the East African rift valley. The park covers an area of about 3,200 km². Most of the plateau lies at 1,800m (5,850ft) above sea level, although the altitude ranges from 600m (1,950ft) near Lake Malawi to 2,630m (8,550ft) at Nganda hill on the north eastern side of the plateau. The climate of the Nyika National Park is cool and moist especially on the high plateau. Rains fall mainly between November and March. However, rainfall is better distributed on the eastern part of Nyika with 2470 and 415 mm in the four driest months (Chapman & white, 1970). Mean daily temperatures at Chilinda (2310m), near the centre of the park, ranges from 17°C in November to 10.3°C in July.

SAMPLING METHODS

A total of seven sites were sampled over a 30 day period (July- August 2009).

Quadrat surveys

Random quadrats sampling was used to determine whether species are randomly distributed or not. Thirty transects 100m long and 100m wide were used. Transect start points and sample plots were determined randomly. Sampling was carried out during the day. This technique ensured adequate coverage. The start and end times as well as GPS co-ordinates were all recorded for possible future sampling. Species, substrate activity and time were also recorded. This technique was used as a supplement to the large mammal surveys.

Pit fall traps and visual encounter surveys

A single array of pit fall traps consisted of ten 20 litre buckets buried level deep with the ground and spread 5 meters apart. A cover was raised 1 inch above the pit fall traps to prevent trapped individuals being predated by birds. Each trap was checked every morning. All amphibians captured were identified in the field using Channing, (2001) and reptiles identified using Spawls *et al* (2004). General visual encounter surveys were also conducted both during the day and night. An area was searched with flash lights. This was intended to provide a relatively complete species inventory. However the focus of sampling was on quadrats which provided the data for analyses.

Site comparisons

Species from similar sites in East Africa were compared including nearest montane and lowland sites (See appendix).

ANALYSIS

As an alternative technique for controlling differences in sampling effort a suite of richness estimators was used. The performance of richness estimators varies depending on differences in sampling effort and the inaccuracies are poorly understood. Thus a combination of indicators was used (Chao 1, Chao 2, first and second order jack-knife), using estimates version 7 software. Patterns of species abundance were evaluated; a relative abundance index was calculated as the total number of individuals divided by treatment. The data between the different habitat types did not show a normal distribution, so the non parametric Friedman's test was used, using XLstat (2009) to test the significance of species distribution. This analysis was used to test whether species are randomly distributed or not.

GENERAL DESCRIPTION OF AMPHIBIAN FAUNA AND SPECIES RICHNESS

The amphibian surveys found a total of 90 individuals of 14 species. For ten species, densities were high enough to provide meaningful information on distribution. *Hyperolius nasutus*, *Ptychadena mascareniensis* and *Arthroleptis stenodactylus* were the most common species. Comparing species richness at a standardized level suggests a high richness in wetland areas. I used a range of species richness estimators which gave a similar pattern of results; grassland (10) woodland (4) riverine (4) wetland (11). Comparisons among major habitat types revealed significant differences in presence/absence data (Friedman's test $p= 0.01$) showing both species and individuals have a non random distribution, (fig 3).

RESULTS

Table1 Species of amphibians found in this study with total individuals and species richness for each habitat

Species	Grassland	Woodland	Riverine	Wetland
<i>Amietophrynus garmani</i>	4	2	0	0
<i>Amietophrynus gutturalis</i>	7	1	0	2
<i>Xenopus laevis</i>	0	0	3	1
<i>Xenopus mulleri</i>	0	0	2	6
<i>Strongylopus fuelleborni</i>	4	0	0	4
<i>Ptychadena mascareniensis</i>	2	0	0	0
<i>Phrynobatrachus acridoides</i>	0	0	2	4
<i>Arthroleptis francei</i>	2	1	0	4
<i>Arthroleptis stenodactylus</i>	0	0	0	3
<i>Hyperolius marmoratus</i>	1	0	0	1
<i>Hyperolius nasutus</i>	6	0	2	10
<i>Hyperolius pictus</i>	1	0	0	3
<i>Hyperolius tuberilinguis</i>	2	0	0	4
<i>Chiromantis xerampelina</i>	5	1	0	0
Number of individuals	34	5	9	42
Species richness	10.0	4.0	4.0	11.0

Figure 1 Altitudinal distribution of amphibian species

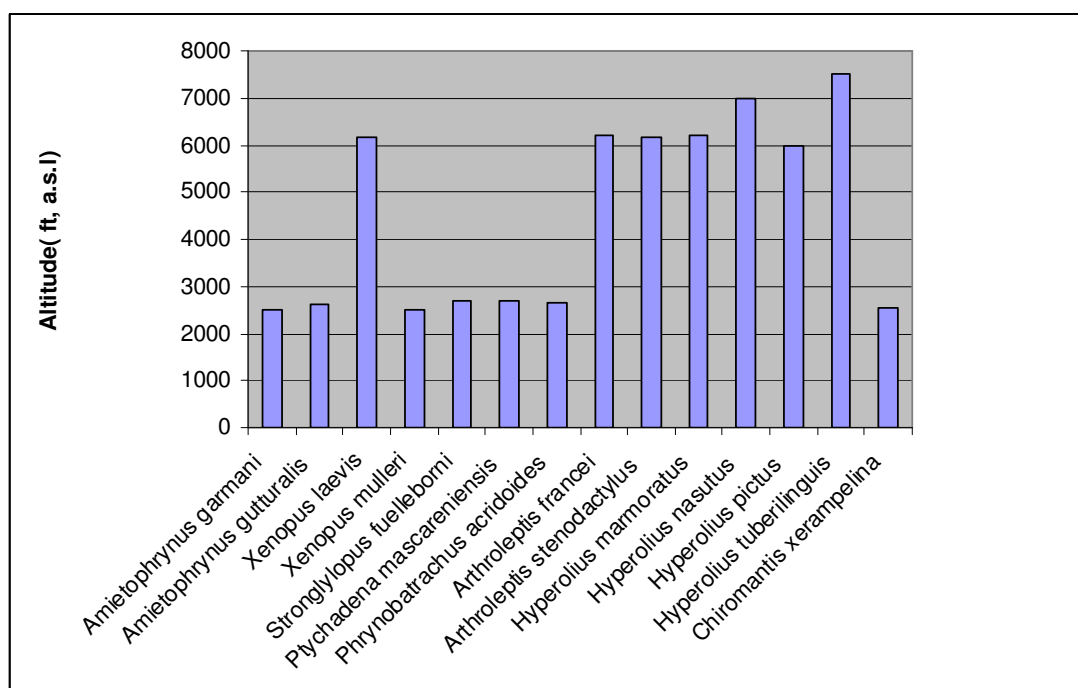
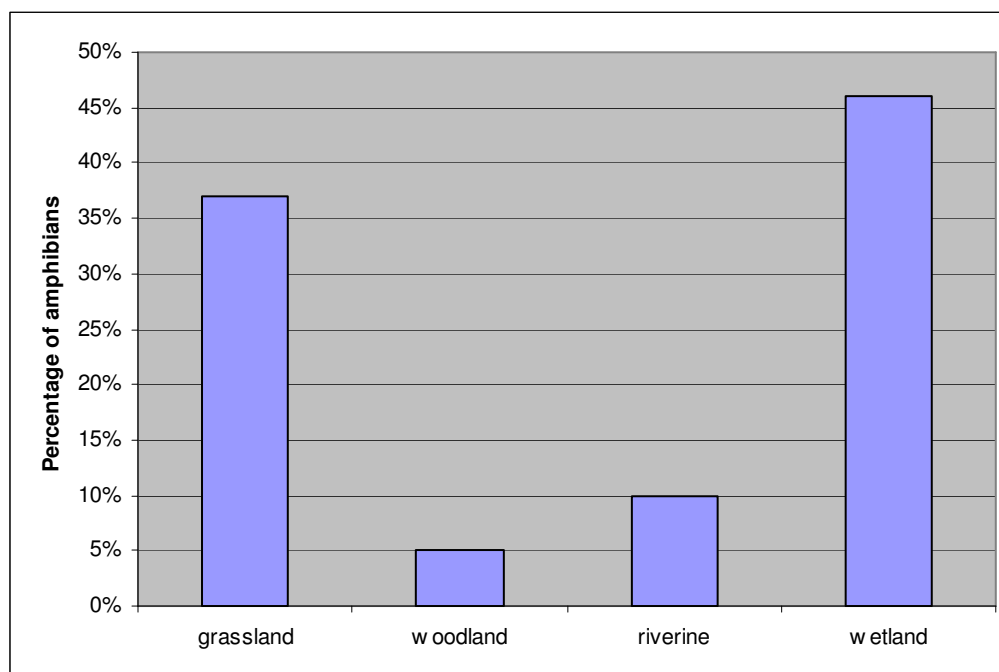


Figure 2 Percentage of overall number of amphibians in each major habitat type.

GENERAL DESCRIPTION OF REPTILE FAUNA AND SPECIES RICHNESS

Reptile surveys found a total of 86 individuals of 13 species. *Trachylepis varia*, *Trachylepis striata* and *Hemidactylus mabouia* were the most common species. No single species occupied all habitats. Two species (*Crocodylus niloticus* and *Pelusios castanoides*) were in numbers too low for analysis and therefore excluded from the data analysis. Species richness estimates were the highest on grassland; (19.0) woodland (14.0) riverine (10.4) and wetland (0.0). Friedman's test shows there is a significant difference between sites ($p = 0.01$), (Fig 5).

Table 2 Species of reptiles found on this study with total individuals and species richness.

Species	Grassland	Woodland	Riverine	Wetland
<i>Agama hispida</i>	1	5	0	0
<i>Chamaeleo dilepis dilepis</i>	0	5	0	0
<i>Chamaeleo goetzei nyikae</i>	0	3	0	0
<i>Rhampholeon nschisiensis</i>	0	1	0	0
<i>Cordylus tropidosternum</i>	2	2	0	0
<i>Hemidactylus mabouia</i>	1	5	2	0
<i>Lygodactylus angularis</i>	3	1	1	0
<i>Panaspis wahlbergii</i>	3	1	0	0
<i>Trachylepis striata</i>	7	4	0	0
<i>Trachylepis varia</i>	21	11	2	0
<i>Latastia johnstoni</i>	1	1	0	0
<i>Crotaphopeltis hotamboeia</i>	2	0	0	0
<i>Psammophis angolensis</i>	1	0	0	0
Total individuals	42	39	5	0
Species richness	11.0	10.0	3.0	0.0

Figure 3 Altitudinal distribution of species

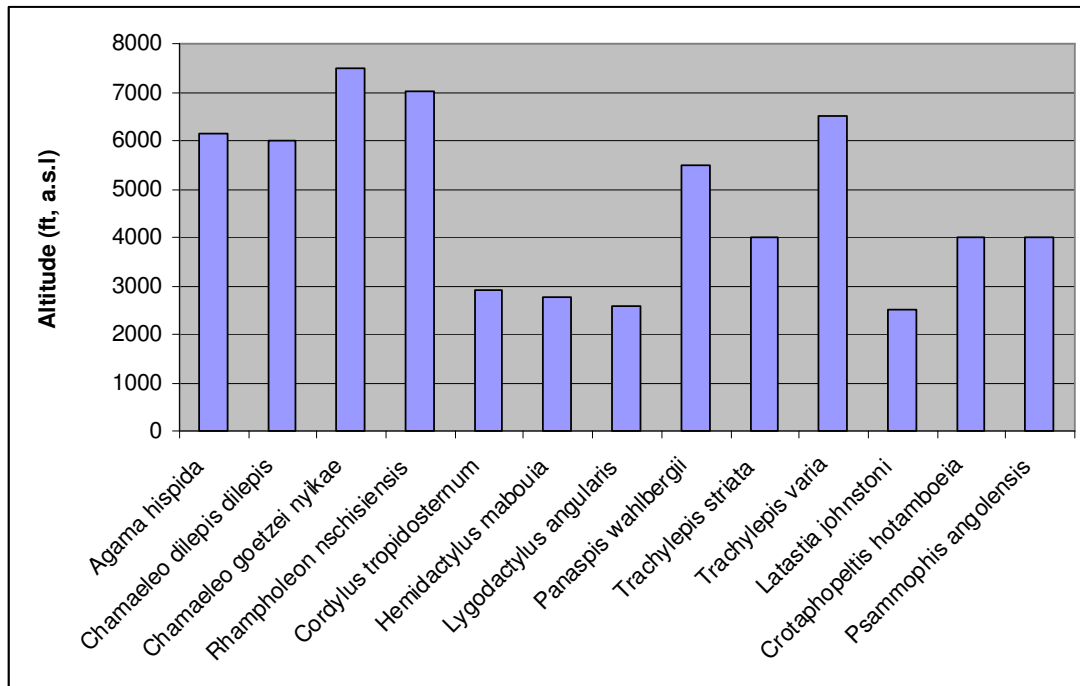
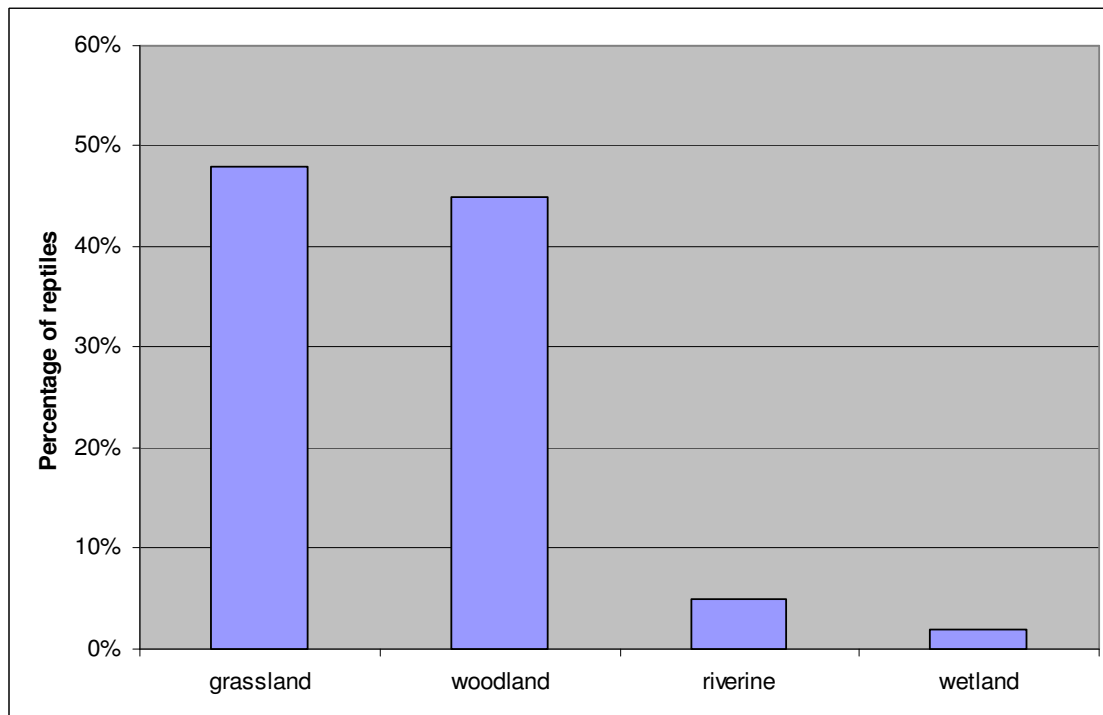


Figure 4 Overall number of reptiles found in each major habitat type



DISCUSSION

This survey provides an insight of the species present and habitat use in a short time period. It is recognised that seasonal fluctuations in precipitation and temperature result in changes in species

composition and relative abundance (Pechmann *et al.* 1991, Gardner *et al.* 2007). This explains why certain species found in previous surveys on the national park were not found in this survey. A total of 14 species of amphibian and 13 species of reptile were recorded for this area. The Nyika national park is known to host at least 34 species of amphibians (Stewart, 1967, Channing 2001 Mazibuko, 2004) and 47 species of reptiles (Mazibuko, 2004) and more species are being found as scientific interest increases (Allingham & Overton, 2008).

Habitats had marked differences in species composition and relative abundance. This emphasizes the importance on long term sampling to adequately characterize fauna in the area. In particular grassland was found to host the most species of reptiles. The burning of grassland as a management tool has created a fire based paradigm for management on these national parks. However the burning of vegetation has an effect on species richness (Masterson *et al.* 2008).

The relative biodiversity value of Nyika for reptiles and amphibians is severely limited. The deployment of intensive sampling is both time demanding and costly which has limited studies to be carried on during a single season.

PATTERNS OF RELATIVE ABUNDANCE AND DIVERSITY

This data suggests the type of habitat has a greater influence on sample richness and relative abundance of reptiles and amphibians than a study site. This observation has been reported elsewhere (Gardner *et al.* 2007). Species not present on this survey but recorded in past reports include *Schismaderma careens*, *Breviceps mossambicus*, *Afrana angolensis*, *Scelotes mirus* and *Chamaesaura macrolepis*. These absences are likely due to the timing of sampling, breeding and foraging habits of these species. The absence of other species is unknown but some may be missed be due to the cyclic population fluctuations (Channing & Howell, 2006).

The abundance of reptiles and amphibians may be particularly promoted during short dry seasons when burnt grass and leaf fall increase arthropod abundance (Wartling & Donnelly, 2002). However, in the dry season in Malawi, moisture is also a limiting factor for many species particularly amphibians. Other observers have recorded a peak in amphibian abundance during the wet season (Allmon, 1991, Vonesh, 2001) due to the wet season's relation to reproductive activity. This observation has important implications for study assessments in the future.

CONCLUSION

The data presented here indicates that patterns of reptile and amphibian diversity in the Nyika National Park can differ in different habitats. Importantly grassland is the most used habitat by reptiles, a conclusion that has important implications on conservation. In addition, the fact that species richness differs between major habitat types means that conservation planners need to give adequate consideration to habitat variety in order to ensure maintenance of diversity. This report shows a superficial level of sampling with a narrow focus on a particular area in a single season, and wider research is needed to clarify whether these patterns of diversity are widespread or seasonal.

Ecological data such as presented here are important to conservation in the face of growing threats to species. An understanding of temporal distribution is vital for effective monitoring (Duelmann, 1995). The findings presented here indicate a relatively poor focus on the herpetofauna of Nyika National Park in proportion to the parks conservation significance. The fact that few research projects have the time or resources to deploy sufficient sampling remains a major problem.

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APPENDIX

Amphibian species site comparisons

Nyika (Mazibuko *et al.*, 2004) Mtele Tanzania (Lawson & Moyer, 2008) Meru, (Wasonga *et al.*, 2006) Udzungwa Menegon & Salvidio (2005) Katavi.(Gardner *et al.*, 2007).

Species	Nyika	Mtele	Meru	Udzungwa	Katavi
<i>Amietia angolensis</i>	X	X		X	
<i>Amietophrynus garmani</i>	X		X		X
<i>Amietophrynus gutturalis</i>	X	X	X	X	X
<i>Amietophrynus maculatus</i>			X		X
<i>Mertensophryne nyikae</i>	X				
<i>Mertensophryne taitanus</i>		X		X	X
<i>Arthroleptides yakusini</i>				X	
<i>Arthroleptis affinis</i>				X	
<i>Arthrolepis francei</i>	X				
<i>Arthroleptis reichei</i>					
<i>Arthroleptis stenodactylus</i>	X			X	X
<i>Arthroleptis xenodactyloides</i>					
<i>Breviceps fichus</i>		X			
<i>Breviceps mossambicus</i>	X				X
<i>Chiromantis petersi</i>		X			
<i>Chiromantis xerampelina</i>	X				
<i>Hemisis marmoratus</i>		X	X		
<i>Hoplobatrachus occipitalis</i>					X
<i>Hyperolius nasutus</i>	X	X	X		
<i>Hyperolius glandicolor</i>		X		X	
<i>Hyperolius kihangensis</i>				X	
<i>Hyperolius mertensi</i>					
<i>Hyperolius minutissimus</i>					
<i>Hyperolius mitchelli</i>					
<i>Hyperolius pictus</i>		X		X	
<i>Hyperolius punctulatus</i>					
<i>Hyperolius tuberilinguis</i>	X				
<i>Hyperolius viridiflavus</i>					X
<i>Kassina senegalensis</i>		X		X	X
<i>Leptopelis barbouri</i>					
<i>Leptopelis flavomaculatus</i>					
<i>Leptopelis parvocagii</i>		X		X	X
<i>Leptopelis parkeri</i>				X	
<i>Leptopelis uluguruensis</i>				X	
<i>Leptopelis vermiculatus</i>				X	
<i>Nectophrynoides viviparus</i>				X	
<i>Nectophrynoides wendyae</i>					
<i>Phrynobatrachus acridoides</i>	X				
<i>Phrynobatrachus mababiensis</i>		X	X		X
<i>Phrynobatrachus natalensis</i>		X	X	X	X
<i>Phrynobatrachus parvulus</i>				X	X
<i>Phrynobatrachus rungwensis</i>				X	
<i>Phrynobatrachus uzungwensis</i>			X		
<i>Phrynobatrachus stewartae</i>				X	X
<i>Phrynomantis bifasciatus</i>				X	X
<i>Probreviceps macrodactylus</i>					
<i>Probreviceps rungwensis</i>			X		
<i>Ptychadena anchietae</i>		X			X
<i>Ptychadena guibei</i>					

**AMPHIBIAN SPECIES
APPENDIX**

Continued from Page 56

Species	Nyika	Mtele	Meru	Udzungwa	Katavi
<i>Ptychadena grandisonae</i>		X			
<i>Ptychadena mascareniensis</i>	X		X		X
<i>Ptychadena oxyrhynchus</i>					X
<i>Ptychadena porosissima</i>			X		
<i>Ptychadena taenioscelis</i>		X			
<i>Pyxicephalus edulis</i>					X
<i>Schismaderma careens</i>	X				
<i>Stephopaedes loveridgei</i>					
<i>Stronglyopus fuelleborni</i>	X			X	
<i>Tomopterna luganga</i>		X			
<i>Xenopus laevis</i>	X	X			X
<i>Xenopus mulleri</i>	X				X
Total number of species	16	18	11	21	21



Top Left: Striped Reed Frog *Hyperolius nasutus*, Right *Hyperolius marmoratus*
 Bottom Left: *Amieophrynus maculatus* Right: Spotted Sedge Frog *Hyperolius tuberilinguis*
 First three by Marianne Overton, Sarah Fowkes



C.P. and M.J. Overton

Top Left: Agamid Lizard, *Agama hispida hispida* at Kawiya, Vwaza

Mid left: Moreau's tropical House Gecko, *Hemidactylus mabouia* at Kawiya, Vwaza

Mid right Shell of a Zambian Mud Turtle *Pelusios rhodesianus* after a fire at Vwaza

Bottom Left; Variable Skink *Trachylepsis varia* on rocks lining the track above near Chisanga

Bottom Right: Wahlberg's Snake-eyed Skink, *Panapsis wahlbergii* in dry woodland below Chisanga camp.



CAMEO OF A CHAMAELEON

Marianne Overton

A RARE FIND: DIARY EXTRACT FROM JUNIPER FOREST CAMP

In cutting the grass for our tents, we had a most exciting find – a rare Goetzeii Chamaeleon with its lack of flap neck, sharp crest of spines down its back and its ability to inhabit grasslands at over 7000ft. We all cooed and photographed adoringly, much to Peter’s exasperation, but supper was in hand.

Rest Day is a chance for everyone to do their favourite activity, so young Ben bemoaned his inability to sleep on past 7.30am! Some went for long walks, some for delicious river swims, photographing our finds, sorting stores or science projects and experimental cooking.

I spent a long time watching the Goetzeii Chamaeleon’s behaviour. He rejected all the enticing wiggly foods I presented, confining himself to flies. He spent all day on the shady side of the stalk we gave him, just two inches off the ground. He was remarkably aware, reacting to people walking past, three feet away. However, he did not react to smoke or the smell of fire, until very close indeed. I cannot imagine they could survive outside the fire break, unless in very thick forest. When disturbed he made an asthmatic wheeze, just as in the text book and tipped himself upside down and hung vertically, swaying in the breeze and darkening in colour, an inch off the ground. To sleep, he chose a dark shadow, kept his camouflage colour (unlike flap-necked chamaeleons) and lay close against the vertical plant stalk, again just a few inches off the ground, with his head tucked into a leaf axil, the leaf over his head. No wonder they have been so hard to find all these years! Now we knew where to look, Shaun found another one that evening, of similar size.



Above: Goetzeii Chamaeleon in sleeping position *Sarah Fowkes*

Left: Stump-tailed dwarf Chamaeleon *Tim Wayman*

PHOTO PAGES

Photos by *Tim Wayman* other than as stated

- 1 View from the Nthalire road looking down into the Chisanga Valley
- 2 Nyika terrain from Mt Futi on the old park border near Juniper forest *Sarah Fowkes*
- 3 Looking along western escarpment towards Chisanga
- 4 The pimple on top of Mount Futi near Juniper Forest *Sarah Fowkes*
- 5 Team on eastern escarpment at Kasaramba
- 6 Juniper Forest
- 7 Evergreen Forest Patch near Juniper
- 8 Collecting plant specimens *Marianne Overton*
- 9 Resting in camp near Mwenembwe Forest
- 10 Team at Zovo Chipolo evergreen forest
- 11 Butterfly (Morphidae)
- 12 Butterfly
- 13 Burrowing Bupestrid beetle
- 14 Dragonfly *Marianne Overton*
- 15 Shield Bug
- 16 Fresh Water Crab *Marianne Overton*
- 17 Flap necked Chamaeleon (*Chameleo dilepsis*)
- 18 *Chameleo goetzei*
- 19 *C. goetzei* on *Helychrysum kirkii* flowers *Marianne Overton*
- 20 Pygmy shrew *Crocidura* sp. At Kawiya, Vwaza *Marianne Overton*
- 21 Bohm's Gerbil *Tatera boehmi* at Kawiya, Vwaza *Marianne Overton*
- 22 Little free-tailed bat *Tadarida pumila* at Kawiya Scout Camp *Marianne Overton*
- 23 Spiny mouse
- 24 *Amietophrynus regularis* Toad
- 25 Spotted Sedge frog *Amietophrynus regularis*
- 26 Lunch under *Brachestegia boehmii* near Chisanga Falls
- 27 *Gnidia buchananii* at the mysterious Lake Kaulime, the only natural lake on the Nyika
- 28 Zebra near Zambian Resthouse on western escarpment
- 29 Elephants at Vwaza
- 30 Vervet Monkey at Vwaza
- 31 Roan Antelope near Lake Kaulime
- 32 Young Baboon at Vwaza *Ben Chessum*
- 33 Impala at Vwaza
- 34 Hippo at Vwaza with Grey Heron



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LARGE MAMMALS

Sarah Fowkes

ABSTRACT

The Nyika and Vwaza National Parks in Malawi are incredibly diverse habitats with many well-known African animals as well as some species that are endemic to the area and are found nowhere else. Therefore these areas must be carefully looked after, and there is a dedicated department of Parks and Wildlife who are committed to patrolling the parks and protecting their inhabitants. Keeping track of the population size of these animals is one of the main reasons that Biosearch Expeditions travel to Malawi each year. It is imperative that any patterns, or fluctuations in animal abundance are quickly noted and actions taken to right any wrongs. In the Nyika, 37 plots each 100mx100m were surveyed for tracks and signs and eight transects covering 236km². At Vwaza, two transects were recorded, one of 40km where only one sighting was made, and another of 1.4kms in the protected sanctuary, where 42 animals were seen.

Work was carried out within a day's walk of our camps around the south of the Nyika National Park, Vitinthiza, Chisanga, Juniper Forest, Mwenembwe, Kasaramba and Ndembera. At Vwaza we worked out from Kawiya Scout Camp, from the Vwaza sanctuary (30km²) and around the Kasuni Lake shore.

In the Nyika, fewer signs and sightings of species were found this year than in previous years. There were more above 6000ft than below. However there were some species that were more abundant below 6000ft like the Bushpig, Roan Antelope, Baboon and Scrub hare. This is probably because of habitat preference, and how altitude changes conditions and terrain. Other species, such as Elephant, Bushbuck, Red Forest Duiker, Porcupine and Blue Monkey were more common above 6000ft.

The number of many species appeared to have seriously declined this year, especially around the Kasaramba and Mwenembwe areas. The scout team identified detailed anti-poaching strategies to assist in correcting the situation, but more patrols will be needed at these vulnerable edges of the Park. Previous years have shown substantial improvements and it can be done again if it is done soon.



Typical Nyika terrain after fire from Mount Futi, looking towards Juniper Forest

Sarah Fowkes

LOCATION

The exact locations of each plot are listed in the Appendix 1. We used grid references, checked occasionally with GPS. (GPS is more difficult to use for navigation in Malawi since the readings are only given in Longitude and Latitude for Malawi. This is ideal for the millennium seed collections, botanical work and the herpetological studies, but to identify map locations, calculations were needed. Work was carried out within a day's walk of our camps around the south of the Nyika National Park, Lusello, Chisanga, Juniper Forest, Mwenembwe, Kasaramba and Ndembera. At Vwaza we worked out from Kawira Scout Camp, from the Vwaza sanctuary (30km²) and around the shore of Lake Kasuni.

METHODOLOGY

There were two main methods of collecting data that we used on the expedition. These were plots and transects. Vegetation data, slope aspect, any recent burning and print-holding quality of the ground were also recorded to assist in interpreting the data. Also in future, an ecologist may want to seek correlations between vegetation and the mammal species or to check whether vegetation has altered significantly between the years.

Random Plots

Plots consist of a 100x100 metre square of habitat in which each member of the team has his or her own area to search for animals and signs. Ten members of the team line up 10 metres apart along a 100 metre line down the edge of a randomly chosen grid reference. Then the team walks in a line for 100m, zigzagging 5m either side of their line searching for signs of animals. This method would have to be altered if the number of people in the group was less than ten. For example if there was only five people conducting a plot then they would have to travel 200 metres to make sure that 100m² of habitat is still covered. This is to try and get an accurate estimate of mammal population size and distribution.



The team studying some Jackal prints near Vitinthiza
Sarah Fowkes



Examples of droppings found in our plots and transects
Sarah Fowkes

Transects

Transects were done by foot and from a vehicle. By foot they were conducted by looking two metres either side of the line on which you are walking and recording any sightings or signs of mammals in the same way as with the plots. From a vehicle sightings only are counted, not signs, as they are far too difficult to spot. Transects were used when it would be difficult to use the plot method, for example in dense forest. We tended to use transects when walking between plots or travelling to and from camps and therefore surveyed a large variety of terrain and vegetation. Some species use tracks specifically, so this method alone would not be representative, but it can pick up species missed by the plots. Transects used in the data analysis only included direct sightings.



Navigating to the randomly selected plots
Sarah Fowkes

RESULTS

The full data from the plot surveys is presented in Appendix 1 and the transect data in Appendix 2. On this year's expedition we saw or found signs of 28 species of mammal.

Table 1 List of Mammals found on our expedition.

Common name	Latin names
Anteater	<i>Ocycteropus afer</i>
Baboon	<i>Papio hamadryas</i>
Blue Monkey	<i>Cercopithecus mitis</i>
Bushbuck	<i>Tragelaphus strepsiceros</i>
Bushpig	<i>Potamochoerus porcus</i>
Common Duiker	<i>Sylicapra grimmia</i>
Eland	<i>Taurotragus oryx</i>
Elephant	<i>Loxodonta africanus</i>
Hippopotamus	<i>Hippopotamus amphibious</i>
Honey Badger	<i>Mellivora capensis</i>
Hyena	<i>Crocuta crocuta</i>
Impala	<i>Aepyceros melampus</i>
Jackal	<i>Canus adustus</i>
Klipspringer	<i>Oreotragus oreotragus</i>
Kudu	<i>Tragelaphus strepsiceros</i>
Leopard	<i>Panthera pardus</i>
Mongoose	<i>Galerella spp</i>
Otter	<i>Lutra lutra</i>
Porcupine	<i>Hystrix africae australis</i>
Red Forest Duiker	<i>Cephalophus natalensis</i>
Reedbuck	<i>Redunca arundinium</i>
Roan Antelope	<i>Hippotragus equinus</i>
Rock Hare	<i>Pronolagus randensis</i>
Scrub Hare	<i>Lepus saxatilis</i>
Vervet Monkey	<i>Cercopithecus natalensis</i>
Warthog	<i>Phacochitecus aethiopicus</i>
Zebra	<i>Equus burchelli</i>
Molerat	<i>Heterocephalus glabe</i>

Species Diversity

We found that the average number of species per plot was higher in Vitinthiza than anywhere else. Factors that could contribute to this fact are the steepness of terrain, the quality of terrain (Vitinthiza had terrain suitable for a large variety of animals), the abundance of poaching activity (we didn't find very much at Vitinthiza this year, but when the previous year's group travelled to the lower river valley they did find poaching evidence) and the distance from a scout camp.

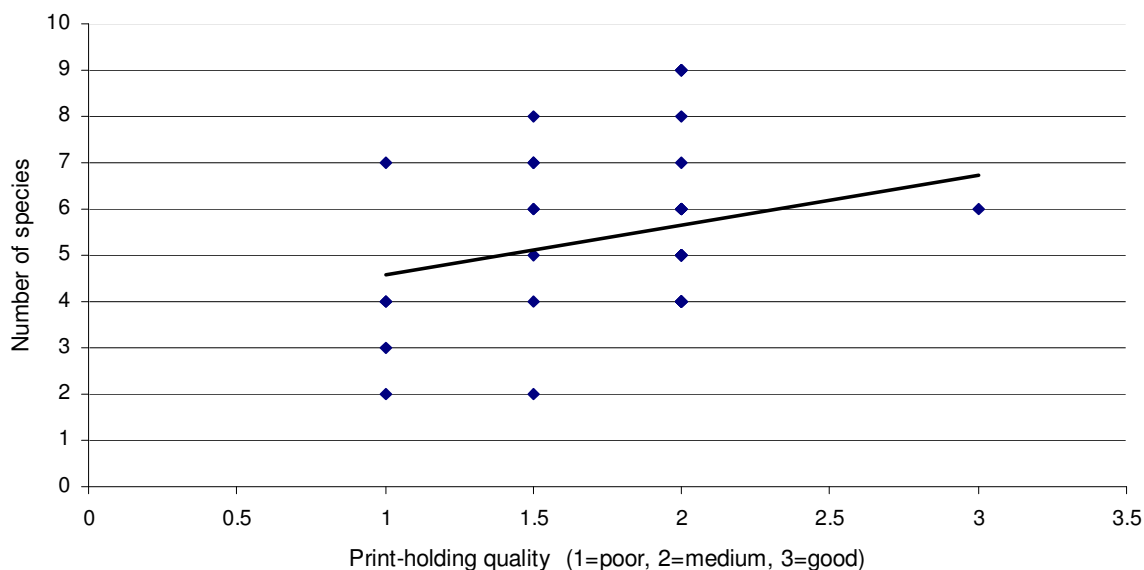
Table 2 Average number of species present (n=number of plots)

	Above 6000ft	Below 6000ft
Vitinthiza	6.5 (n=11)	8.7 (n=3)
Juniper	5 (n=7)	
Kasaramba and Mwenembwe	3.2 (n=7)	
Ndembera	3.2 (n=4)	
Chisanga	6.5 (n=2)	4 (n=3)

Above 6000ft showed the greatest diversity, especially at Vitinthiza and Chisanga.

We compared the print holding quality with the number of species found in that area, and did find a trend that as the print holding quality improved then the number of species we found signs of increased. This is illustrated in Figure 1. If there is poor print holding quality then some soft footed (for example leopards and jackals) animals will not be counted as the prints will not show up whilst the prints of say, an elephant will almost always be found if present.

Figure 1 Correlation between print-holding quality and number of species recorded per plot



The tracks and signs that are recorded are a collection made over some months. Tracks made in the wet season are included, often set in the dried ground. The print holding quality would have to be very poor to have a large effect on our results as we also have droppings and damage recorded. Every dropping counts as a score on our plot survey whereas prints are only counted up to 3, lessening the variable effect of the print-holding quality.

Enough results need to be taken to be representative for a year by year comparison. We have 31 plots in the Nyika over 6000ft, but only six below 6000ft. Elephants, even single or very few in number made a great deal of droppings and signs when resting up in a small area of long grass and forest, hence the high score of 76 (73 droppings) in one plot in Chisanga.

Consideration was given to grouping the data differently to separate out Chisanga, rather than all six plots below 6000ft, but discarded. Keeping to the method as in previous years gives continuity and in fact, gives results more in line with previous years. Chisanga does look unique, affected by the constant water supply, but altitude is still the most significant factor on the species present.

Relative Abundance

Some species were very obviously more abundant than others. From tracks and signs alone, however, it is difficult to distinguish between there being a large number of animals in one area, or just one very active animal. Both would leave a lot of signs and can be hard to tell apart. So, it is more accurate to compare relative activity of a species to previous years and to other areas. Also, in the plot data, we limited the possible scoring of damage and tracks to a maximum of three. This was so that if there were a single, overly active animal leaving a great number of signs behind it would not look as though there was a huge group of that animal, when there wasn't.

Comparing large mammal activity on the Nyika, above and below 6000ft.

The relative abundance of large mammals from 37 randomly selected plots on the Nyika is shown in Figure 2. The data in blue from plots above 6000 feet is collated from 31 plots, each 100mx100m. Only six plots below 6000ft were studied, so this data is indicative only, and not a truly representative sample size. For example, the high elephant activity was confined to the Vithiniza and Chisanga areas, so a high apparent abundance is given below 6000ft, but this is only in a very limited area. More plots below 6000ft would give a more accurate picture.

Some species are clearly more common at the higher altitudes, such as Elephant, Porcupine, Aardvark, Mongoose, Blue Monkey and Klipspringer. Bushpig, Baboon and Scrub Hare do seem to be more common at the lower altitudes, perhaps followed by the Leopard.

Figure 2 Large mammals in the Nyika National Park (using random plot data)

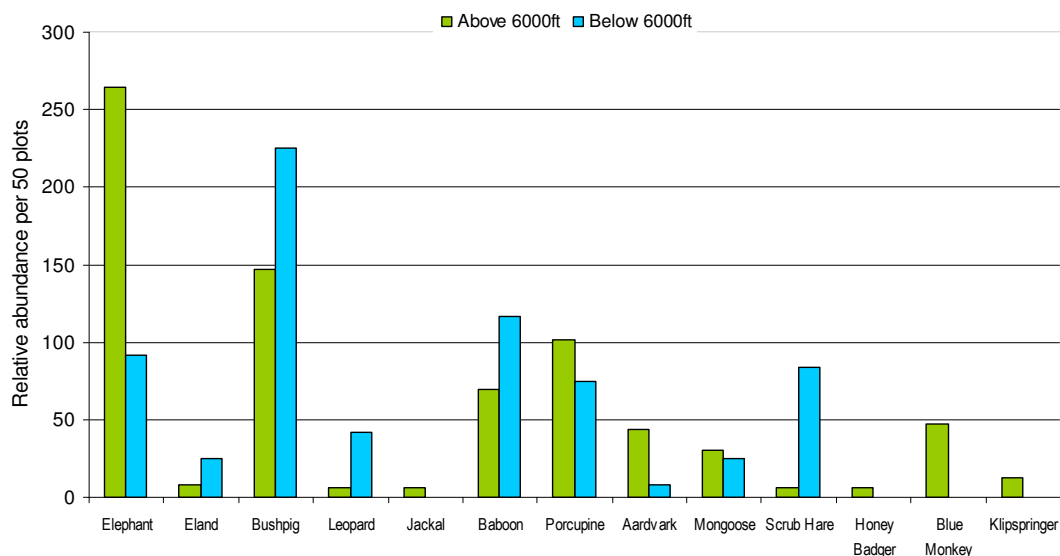


Figure 3 Relative abundance of large mammals in the Nyika (all 2009 data from 37 random plots)

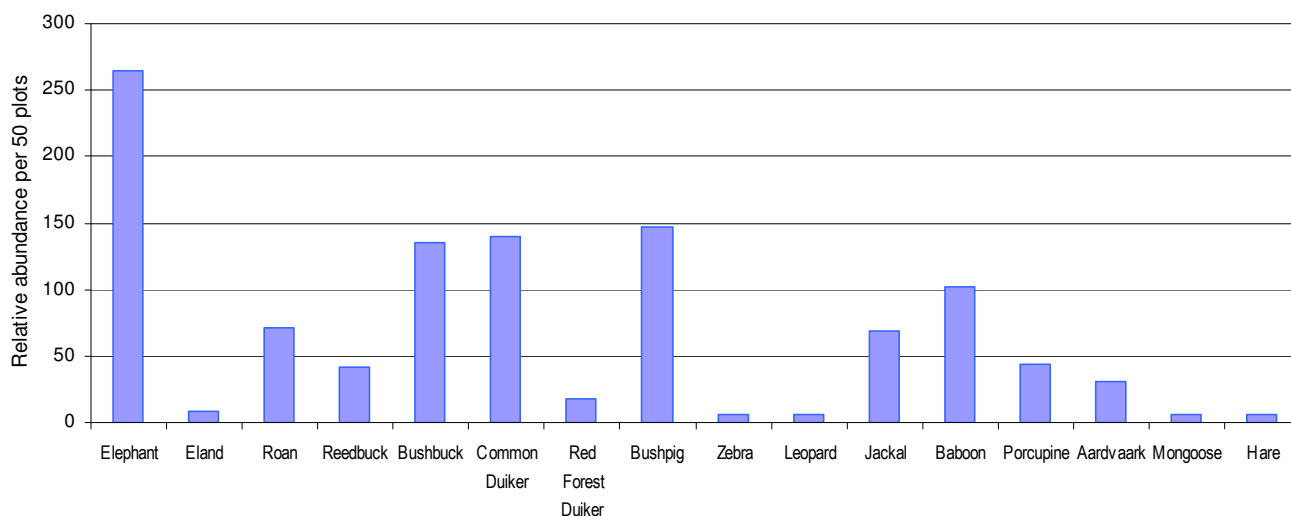
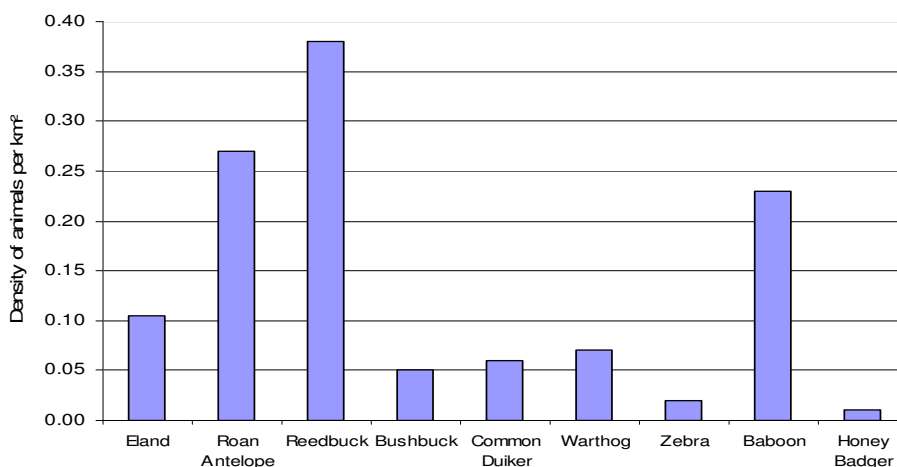


Figure 4 Density of large mammals in the Nyika (all 2009 data from eight transects)



Comparing the data from plots and transect methods

Figure 3 and 4 give information on the large mammal populations of the Nyika using random plots and transects respectively. Some species were missed by the transect method, notably Elephant, Red Forest Duiker, Bushpig, leopard, Jackal, Porcupine, Aardvark and Mongoose. These species are harder to see because they are nocturnal, uncommon or hide in dense forest. Thus we rely on tracks and signs for these species. The transect data gives a density of population per km², rather than just a relative abundance. The biggest source of error in the transect data seems to be in estimating the distance to the animal and the overall visibility distance. Animals that habitually stand out on the veldt were more visible and higher counts were achieved for these animals, especially the Reedbuck and Roan Antelope. Most useful in this method is noting the herd sizes, which we cannot do by tracks and signs. For example, only one herd of Eland was seen, with 16 animals, whereas in the past very large herds were recorded. Three herds of Roan Antelope were seen of 10, 20 and 21 animals respectively, gathering in sheltered areas. The Baboons were in two groups, one of fourteen and one of forty.

Comparing Population densities in the highland Nyika and lowland Vwaza Game Reserve

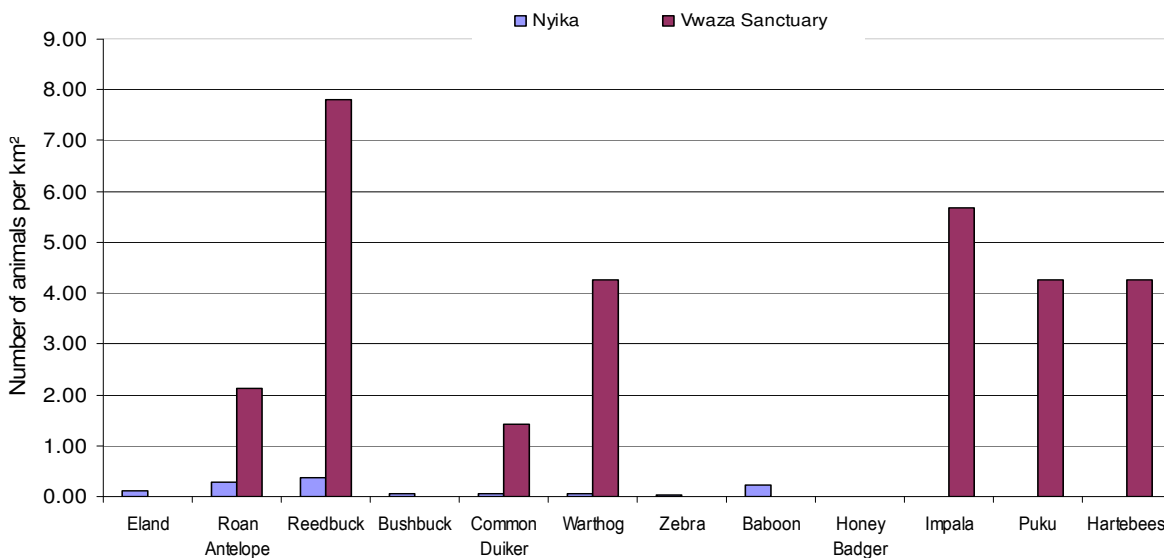
Figures 4 and 5 show the population densities based on actual animal sightings whilst out walking or by vehicle. The survey area is calculated by multiplying the average distance over which a duiker

would be visible by the number of kilometres travelled along the set route, known as a transect line. The number of species seen is divided by the number of km² surveyed. This is the density of animals per square kilometer (km²).

Table 3 Density of animals (per km²) based on sightings only along transect lines

	Nyika	Vwaza Sanctuary
Eland	0.11	0
Roan Antelope	0.27	2.13
Reedbuck	0.38	7.81
Bushbuck	0.05	0
Common Duiker	0.06	1.42
Warthog	0.07	4.26
Zebra	0.02	0
Baboon	0.23	0
Honey Badger	0.01	0
Impala	0	5.68
Puku	0	4.26
Hartebeest	0	4.26

Figure 5 Density of large mammals by transect sightings



The Nyika data is based on eight transects, over 139.2kms, surveying 236.64km² on foot or by vehicle. All surveys were carried out in the daytime, save one vehicle journey at dusk, when the pair of Honey badgers was seen.

The Vwaza survey data is of a single survey over 5km from the North gate of the fenced Vwaza Sanctuary (425692) east along the fence to the River Luwewe. It seemed a long, dry walk with little to view, other than following the old trail of a lonely hippo seeking an exit from the sanctuary. However, close to the small river, game was much more abundant, with the added luxury of fresh green shoots on a managed area of burnt grassland. By contrast, we saw no game in the Sanctuary from the road, surrounded by dry woodland.

A 40km walk through the Vwaza lowland, travelling out west from Kawiya Scout Camp (560 974) to Chametete Pool and returning on a slightly more northerly route, enabled us to survey about 8km². In all that time, we saw only one animal, a bushbuck that darted out from our feet. (That is a density of 0.13/km²). Arriving at the Chametete Pool at evening drinking time also revealed no sightings. There were signs of poaching honey, illegal burning and signs of legal licensed fishing, left from the wet

season. Directly adjacent to the dry bush of the National Park, people were growing lush oranges and other crops using water from boreholes. They complained about elephants coming to eat their crops at night, which was very hard for one scout to deal with, his colleagues being out on patrol.

In Vwaza at this at this time of year, the game is very much centred on the Lake shore and the Rivers. Of the two Parks, only Vwaza had Impala, Puku and Hartebeest, whereas Zebra was only on the Nyika.

We also heard Bushbaby calling at night from our camp close to the Vwaza Lake shore.

Sydney and Kit reading the signs on the dry shore of Kazuni Lake in the Vwaza Marsh Reserve.

Sarah Fowkes



Comparison of populations over time

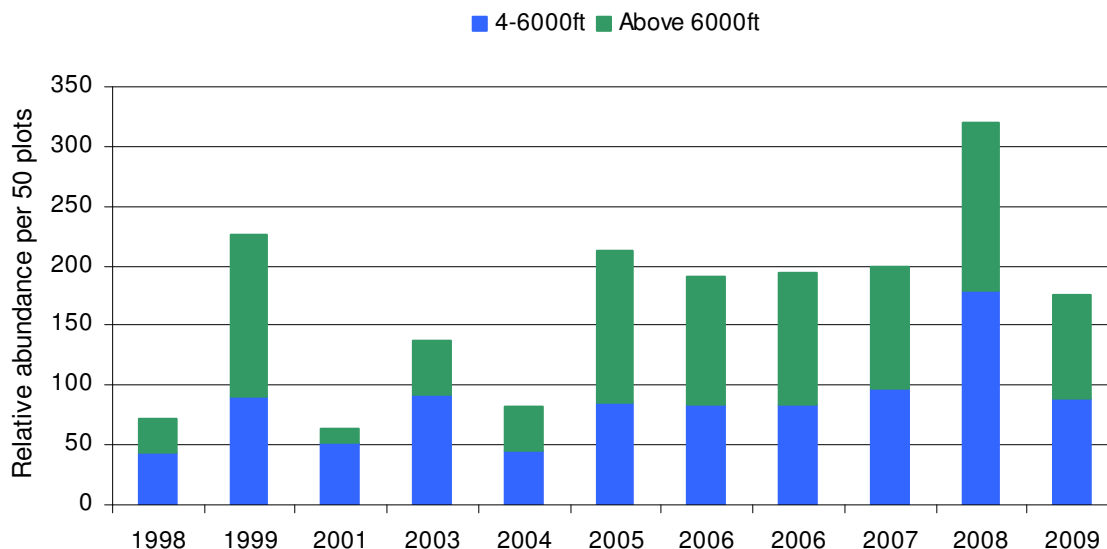
The relative abundance of large mammals based on the data collected from randomly selected plots in the dry season (July/August) between 1998 and 2009 are shown in Appendix 3.

As in previous years, the data is divided into plots above 6000ft and plots below 6000ft, because that is the line at which the vegetation changes from upland plateau grassland to a layer of *Protea* Scrub and down into *Brachystegia* Woodland. This line is less clearly defined on the eastern escarpment which receives higher rainfall lifted from the Lake. However, in this study, only plots above 6000ft were done on the eastern slopes at Mwenembwe and Kasaramba. This is the first time this area has been included in our studies.

Overall

Figure 6 illustrates the average relative abundance scores for the Nyika overall, giving an indication of overall activity levels that are visible using the method of randomly selected plots.

Figure 6 Average Relative abundance of species in the Nyika



Elephant

Unfortunately this year, unlike previous years we didn't get any Elephant sightings in Nyika. However, there is no significant difference in plot data between last year and this year. In fact, in places like Chisanga we found a very large number of signs, which would show that there are still Elephants on the Nyika. We did have to leave a forest in the Juniper area due to the presence of a lone bull elephant, but still no sighting. Elephant signs are not hard to miss. Figure 5 illustrates that the elephants do seem to have moved uphill since last year, as the signs from above 6000ft were greater and those less than 6000ft were less. Figure 6 illustrates that overall numbers of signs have increased slightly from 202 to 222.

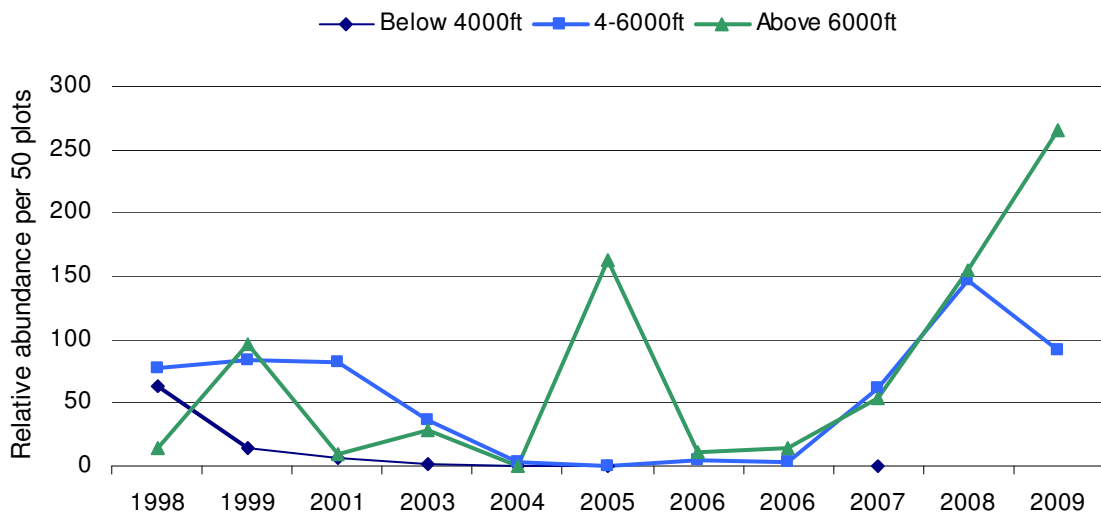
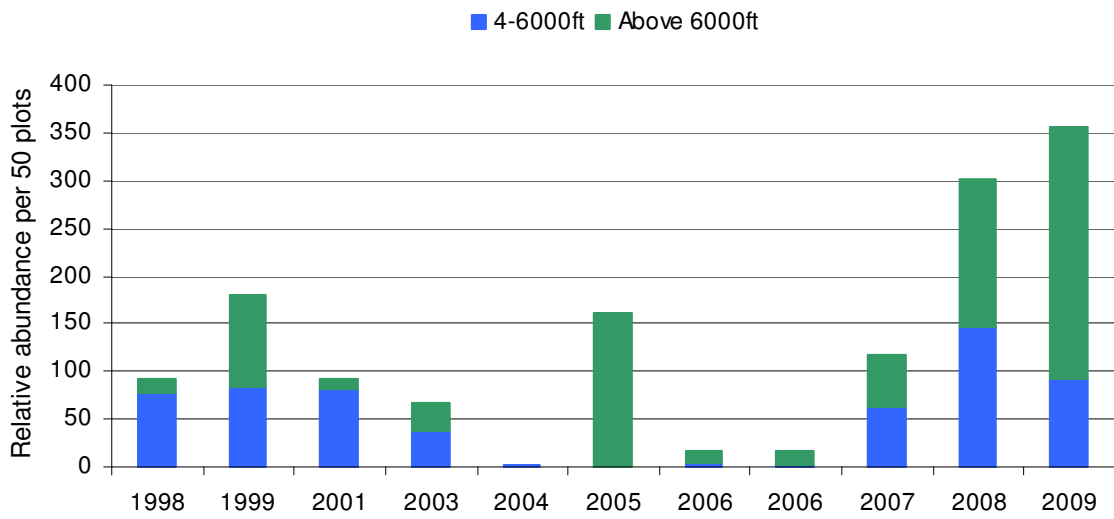
At Lake Kasuni in Vwaza we were fortunate to see huge groups of Elephants (around 50 in the biggest herd) meeting to drink at the lakeside, made up of three herds who took turns to drink. This herd went on to feed on *Acacia* thorn trees and small clumps of dry grass. Elephants are expected to be more common in lowland areas and there is an all year water supply. It is possible that successful populations are also enabled by food sources supplemented from outside the Park. The killing of an elephant would be a difficult crime to hide in these villages. The increase in elephant populations suggests that good protection by scouts (who regularly patrol the lake) can help species prosper.



Elephant herd by Lake Kasuni in Vwaza

Sarah

Figure 7a and 7b Relative abundance activity of the Nyika Elephants
a) Two altitudes combined **b)** Three altitude ranges separated out

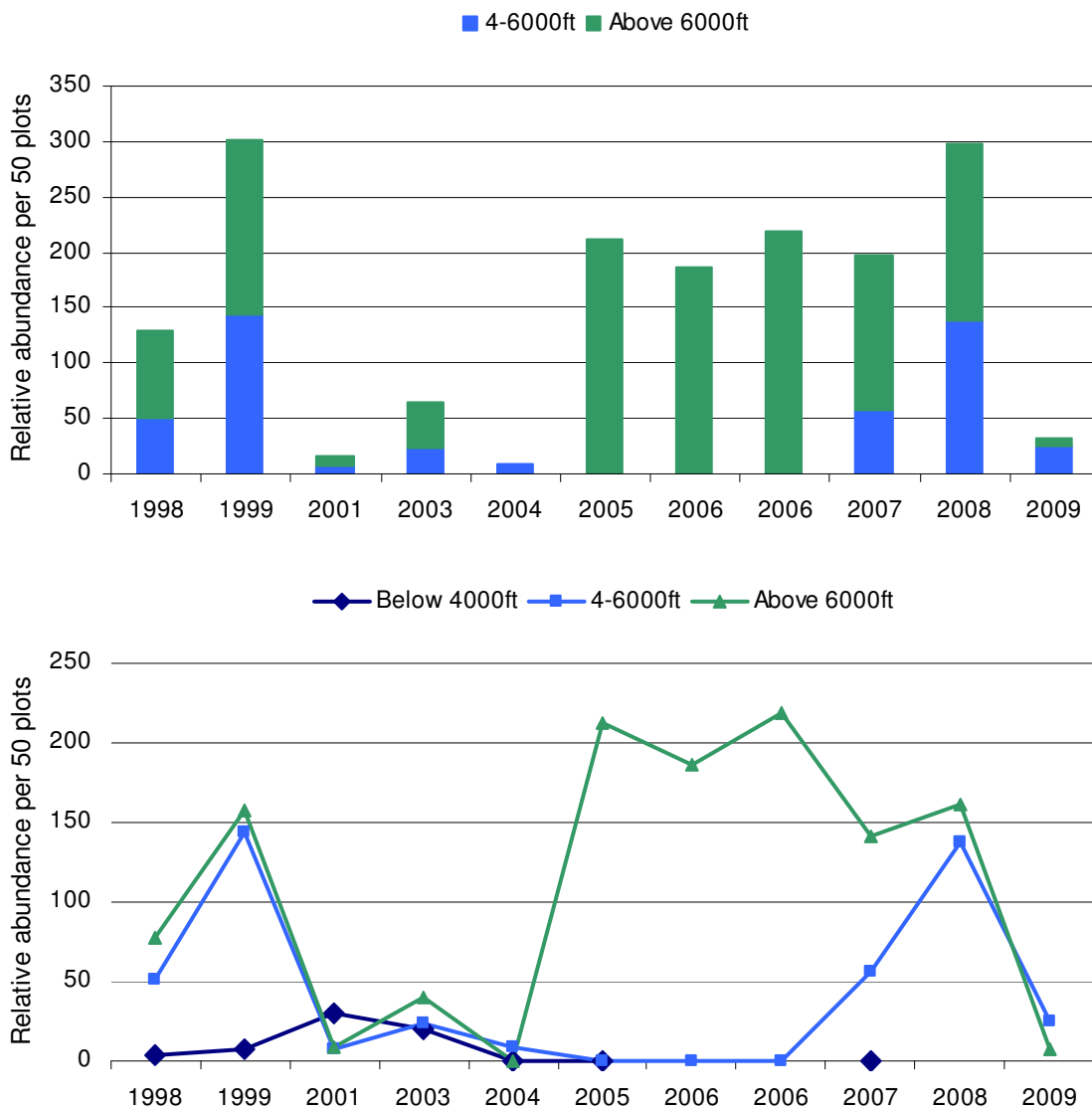


A healthy herd of thirteen elephant with young on the shore of Lake Kasuni
 Sarah Fowkes

Eland

Eland appears to be in decline. Though we did not investigate the north of the Park, previous years have not indicated it is likely to be significantly different. Sightings from the transects indicated few herds and only a small number in each (2, 3, 4 and 16). The relative abundance recorded this year 2009 at both 4-6000ft and above on the plateau was surprisingly low. The density on the plateau estimated from the transect data was 1 animal per 10km² and absent from Vwaza.

Figure 8a and 8b Relative abundance of Eland a) overall and b) by altitude



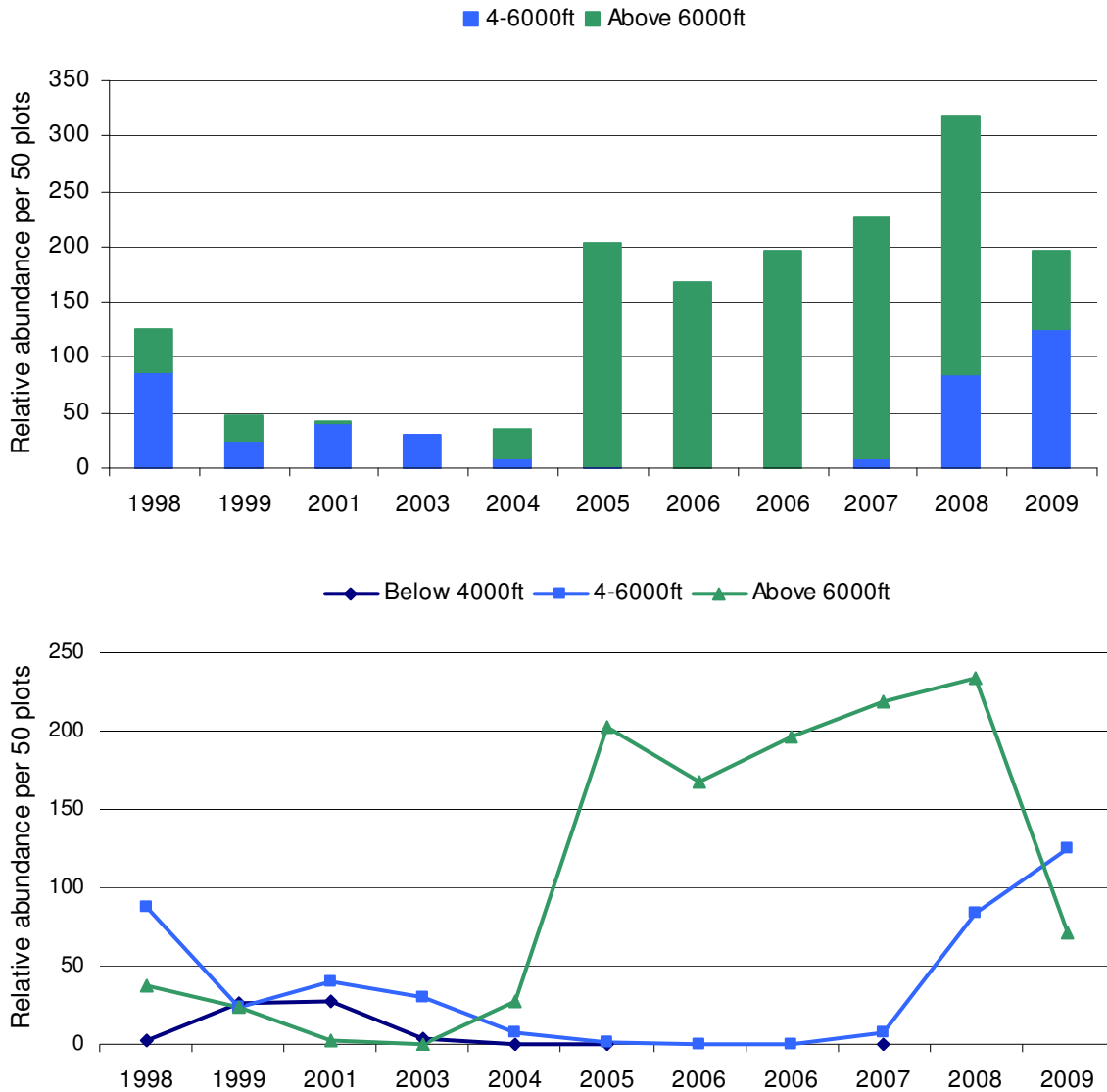
Kudu

Kudu were absent in our findings and have unfortunately not been seen since 2007. This could be because they prefer lower altitudes, and this was evident with the sightings we got at Kasuni Lake. Therefore we would be unlikely to see them at many of our camps as they were at relatively high altitudes.

Roan antelope

There were fewer tracks and signs of Roan antelope this year than last, especially on the plateau. The poachers arrested while we were at Chilinda were carrying large quantities of Roan antelope and Bushbuck, butchered and dried. They did not confine themselves to the slopes on the edge of the Park close to the villages on the Eastern escarpment, but well worn trails were found directly linking the villages right into the main plateau. On the plateau, Roan was estimated to be 2.7 animals per 10km² but in Vwaza, this rises to 21.3 per 10km².

Figure 9a and 9b Relative abundance of Roan antelope a) overall and b) by altitude



Eland and Roan Antelope

This year's results for Eland and Roan Antelope are perhaps the most worrying. Both have decreased since last year on that plot data by almost 150, and whilst we did have a number of sightings of each, they have obviously decreased in numbers since last year.

Eland have decreased at both above and below 6000ft, however (hopefully) they may have just moved to another part of the park, however there were few tracks left from the rainy season. Their sightings and signs have decreased to the 2004 levels. They were scarce away from Vitinthiza and there was just one record made in Juniper. Overall there were only five plots where Eland were recorded and four were in the Vitinthiza area. However the transect records, covering a wider viewing area show 16 Eland sightings near the Vitinthiza area. Four were sighted not far from Chisanga at 825 307, three at 964 236 on the road to Juniper, two were sighted to the South East of Chilinda.

The Roan Antelope were also down in numbers, especially at high altitudes. Sightings and signs were fairly common in the Vitinthiza area; 12 out of 16 plots contained signs of them. But they were absent from everywhere else except for one record in Ndbera. From looking at the transect data, we did have a number of sightings at Vitinthiza and 14 between Chisanga and Juniper.

It was disturbing to see just how near the Roan in particular were happy to let us get to them. This could be one reason why their numbers have decreased recently, if they let poachers get this near they will be easy targets.

Reedbuck and Bushbuck

These two mammals became some of our most common sightings, however after comparing with previous records it tells a different story. Both have decreased by a score of around 100 on the Plateau from last year, which is a very worrying reduction. Our plot data and our transect findings both show that Reedbuck and Bushbuck are still present on the Nyika and the Vwaza, but it is evident that their numbers have taken a hit this year.

Reedbucks prefer open, high areas and so it was not surprising that we found them in the Vitinthiza and Ndbera areas, and not really anywhere else whilst collecting the plot data. However, whilst conducting the transects we found a wider spread distribution than when we did the plots. In particular, on the later transects, between Chisanga and Km 9. Reedbuck became common amongst our sightings. Reedbuck has been absent from the lower altitudes in all surveys since 1998.

The characteristic habitat choice of Bushbuck is bushy areas, so we expected to find signs in the Juniper and lower Vitinthiza areas, which we did. Therefore it seems to be that it is habitat choice, rather than effects like poaching that limited our sightings of the Bushbuck, which are found at all altitudes where there is cover.



Reedbuck on the Nyika (2006)

Peter Overton

Figure 10a and 10b Relative abundance of Reedbuck a) overall and b) by altitude

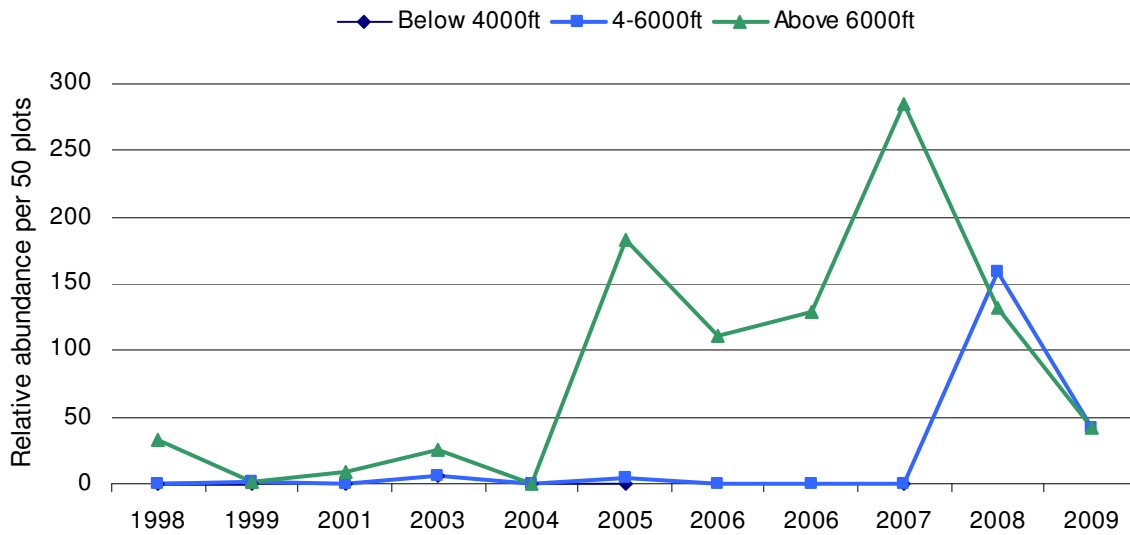
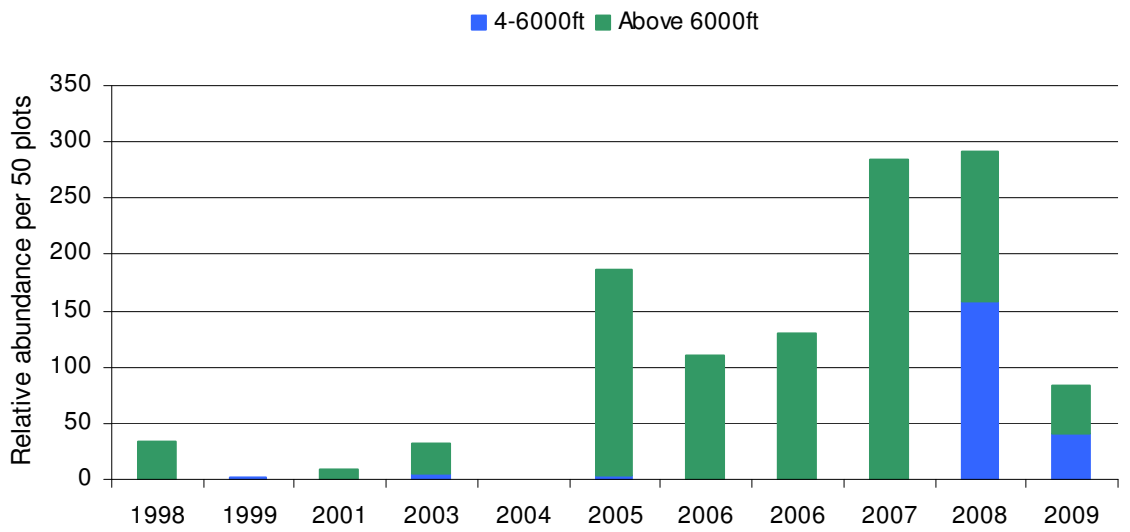
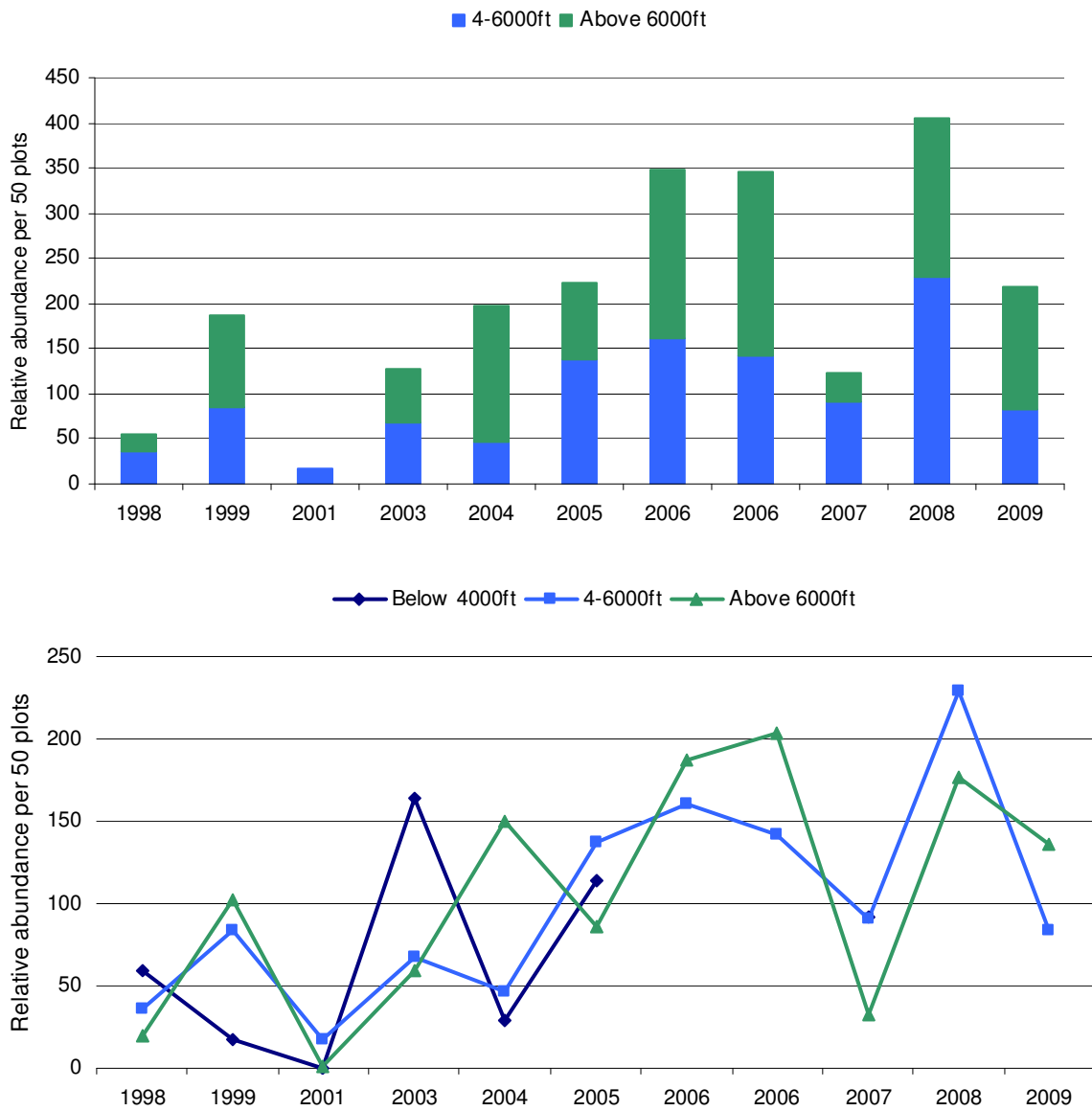


Figure 11a and 11b Relative abundance of Bushbuck a) overall and b) by altitude



Male Bush buck at Chilinda

Sarah Fowkes

Bushpig and Common Duiker

These two also show the same troubling drop in observed activity and consequently numbers. Both are found at all altitudes.

We did not get any sightings of Bushpig this year, and whilst we did see a good number of Common Duiker both species' results have dropped significantly from previous years. Using only plot data, it is difficult to assess Bushpig abundance as only a few animals can make a huge amount of damage that we may see as a large group of Bushpig. This Bushpig skull was found in a forest.



Common Duiker results were at the lowest for five years, however the signs and sightings that we did have were widespread over most terrains in both plots and transects. We did get an amazing encounter with a young Common Duiker when it was spotted behind a tree along a transect path we were taking, it was only a few days old according to the scouts

Figure 12a and 12b Relative abundance of Bushpig a) overall and b) by altitude

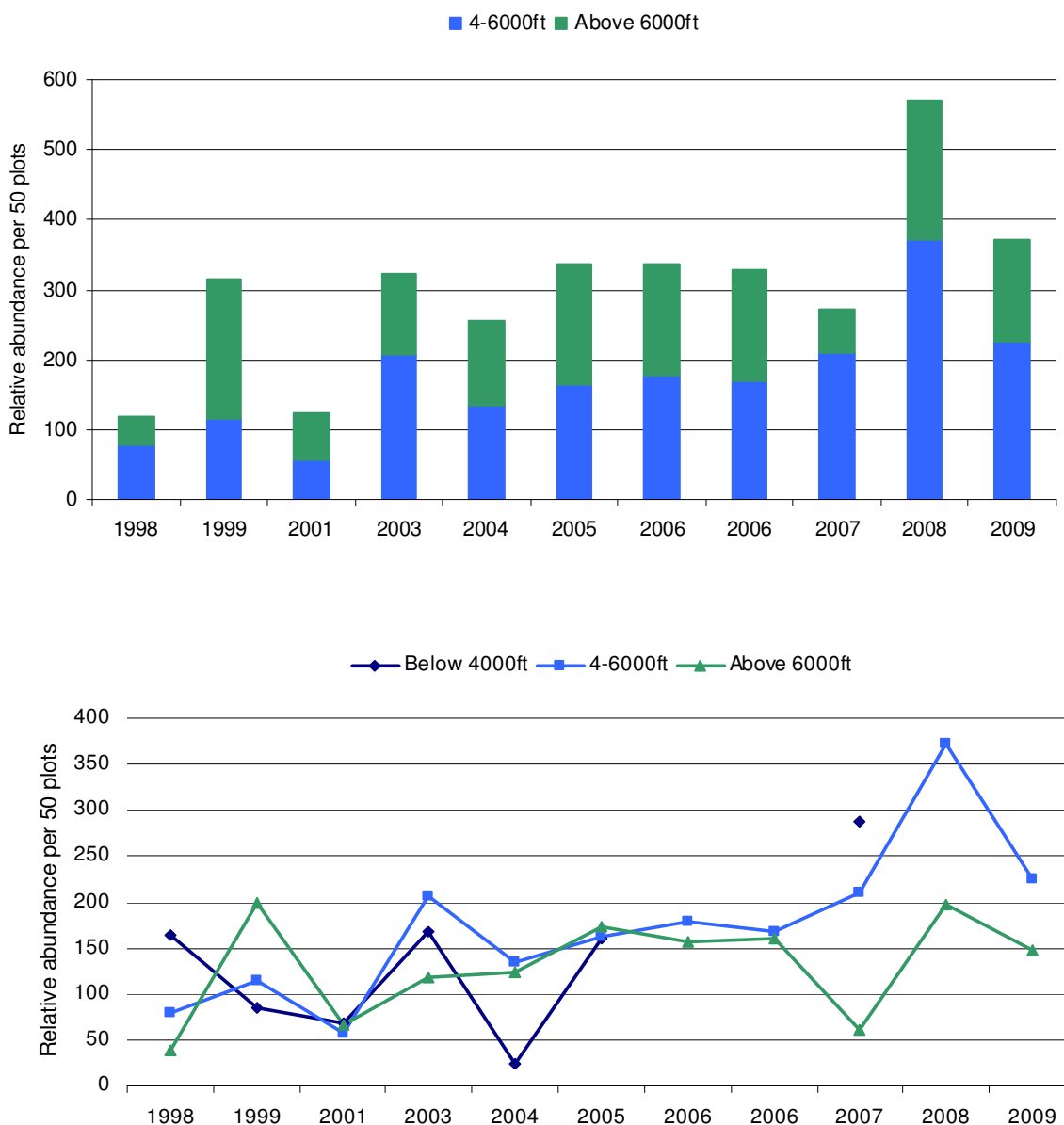
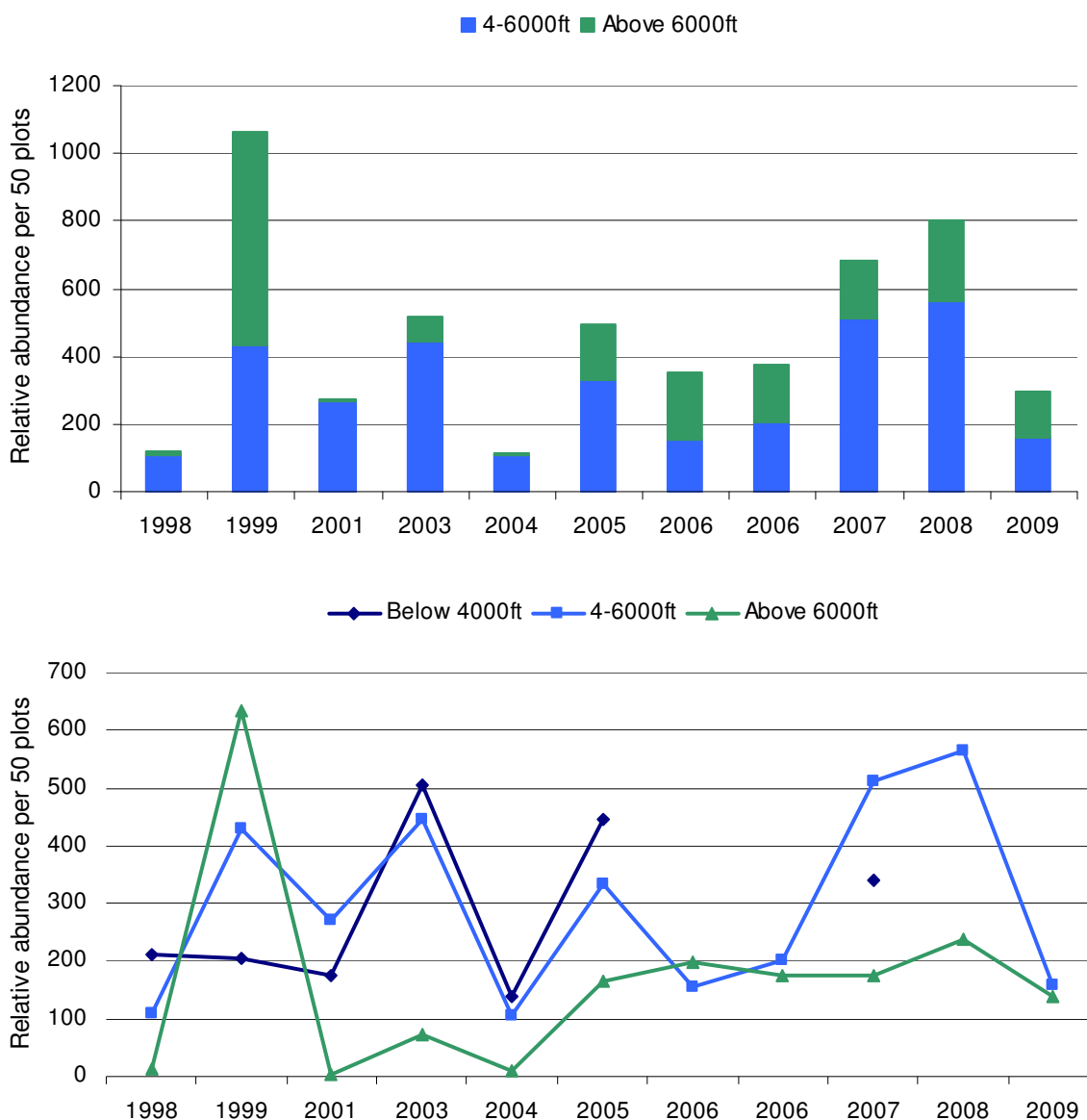


Figure 13a and 13b Relative abundance of Common Duiker a) overall and b) by altitude



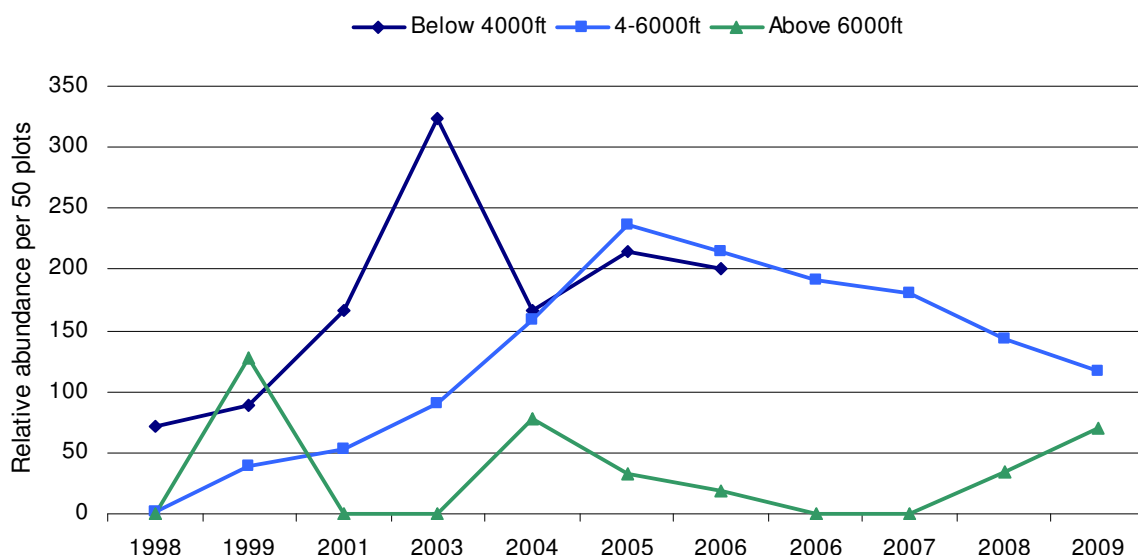
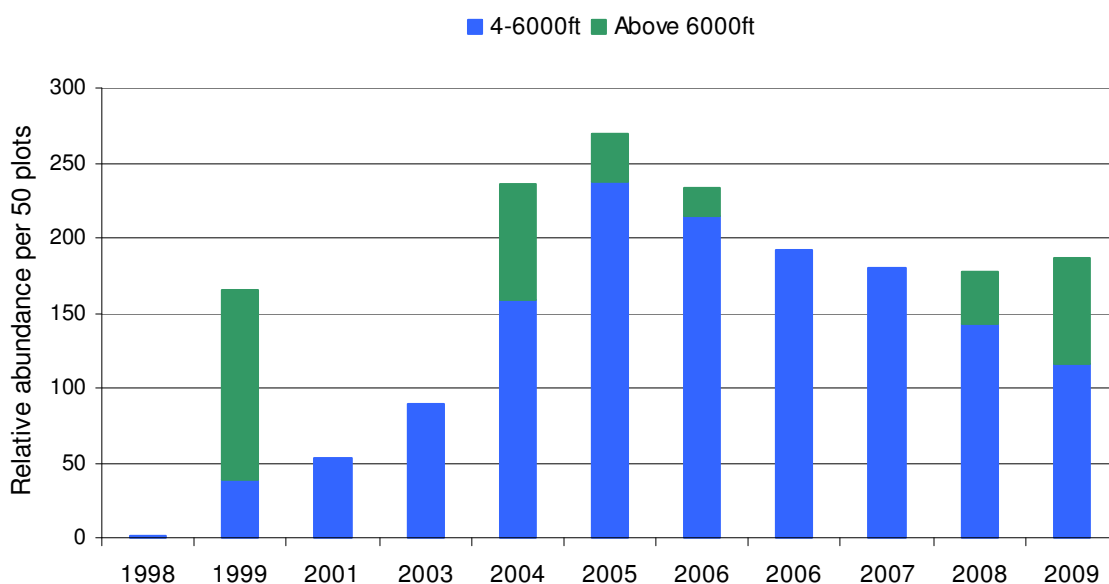
Klipspringer

We did get a good sighting of a Klipspringer on Mount Futi, near Juniper Forest but this was the only place that we found any signs and numbers are slightly down on last year.

Baboon

Baboons, we came to discover, are usually heard before they are seen. A very sociable mammal, when you find Baboons you seem to hardly ever find one on its own. Baboons seem to migrate to the trees whose fruits are coming out, so it is easier to predict where they are going to be than many other mammals. Their numbers have risen this year (despite a slight decrease at lower altitudes) and seem to be the highest for around five years. We had an especially good sighting near Vintintha peak where a group of over 40 Baboons were feeding on *Brachystegia* seedpods on the path we were taking. The Baboons there seemed very wary of us, which is excellent as they can't afford to be tame with poachers around. In contrast, the Baboons near our camp at Kasuni Lake in Vwaza were happier for us to get near and watch them. This would be because Kasuni Lake is home to many scouts, and visitors. Baboons also seemed most common in the lower altitudes.

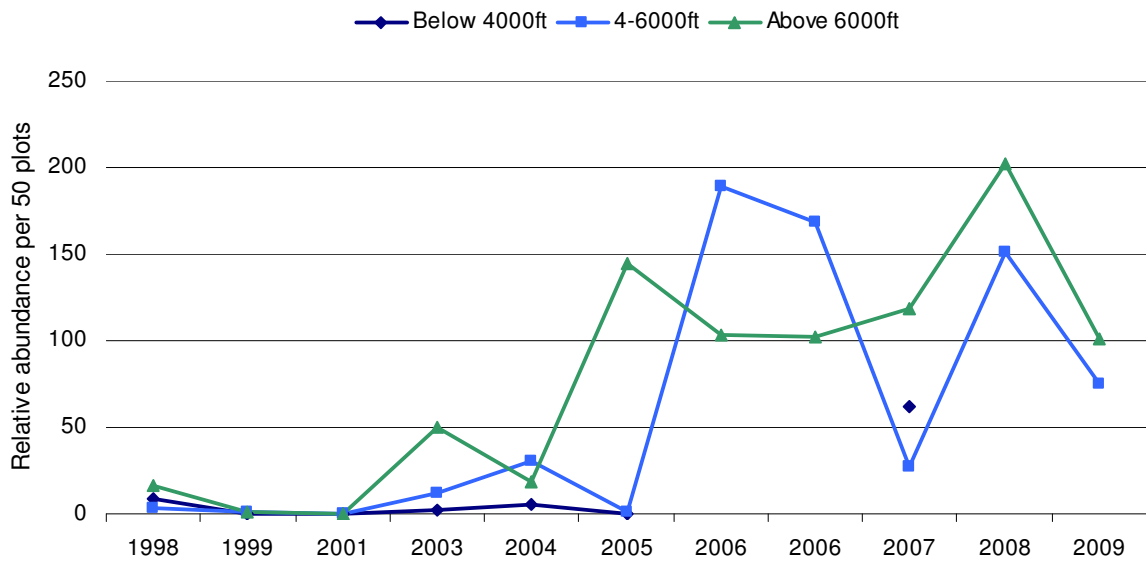
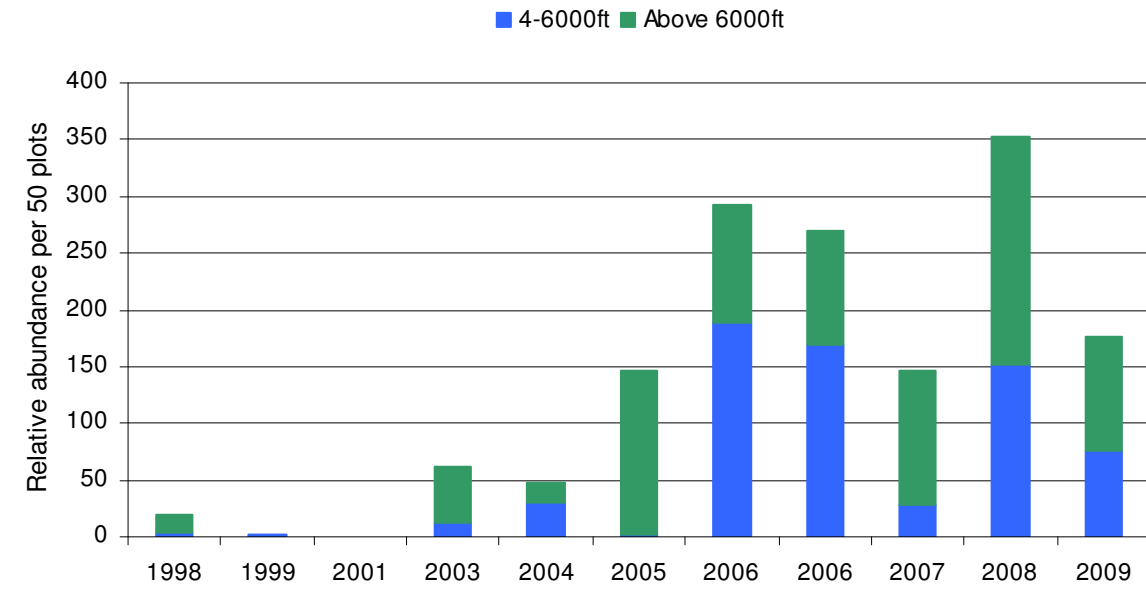
Figure 14a and 14b Relative abundance of Baboon a) overall and b) by altitude



Porcupine

The porcupine is another mammal that we did not get to see this year. However they are very evasive and we did find a lot of signs, so we know they are still living on the Nyika. The signs we found were widespread both above and below 6000ft, with a notable exceptions of Kasaramba and Mwenembwe where there were signs of poaching. Porcupines were especially abundant in Juniper where their preferred habitat of scrub slopes around the forest was found. There was particular evidence along the paths due to the smoother terrain. Although we did record a good number of signs on the Plateau (over 100) it is half the number of signs that were found last year. Poaching appears to be damaging the populations at the edge of the park (Kasaramba and Mwenembwe) but elsewhere signs were as in previous years.

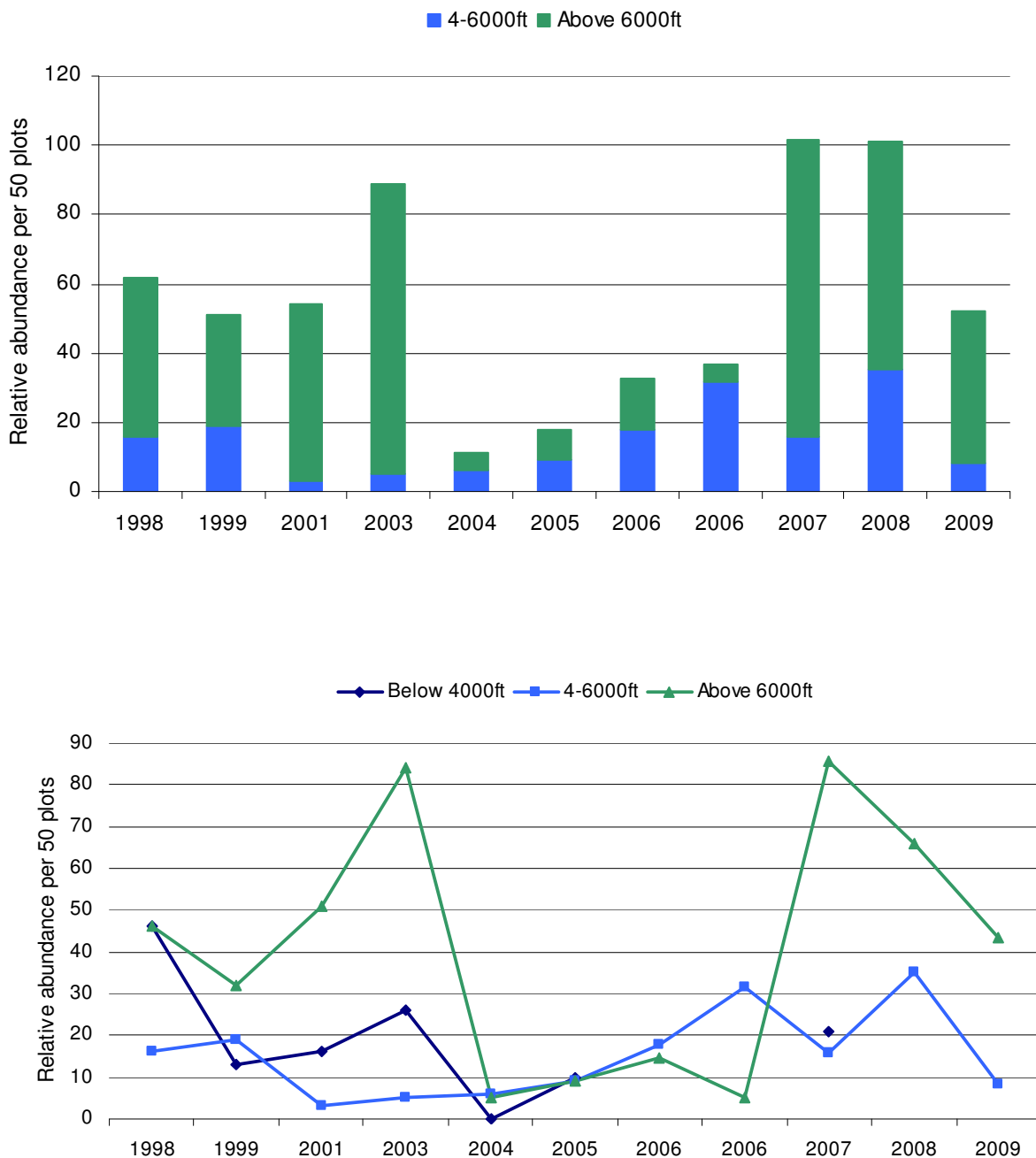
Figure 15a and 15b Relative abundance of Porcupine a) overall and b) by altitude



Aardvark (also known as Anteater or Antbear)

Although we didn't get to catch a glimpse of an Aardvark this year, it was clear that they were there from the amount of diggings and damage we found. Whilst we found a good number of signs on the Southern Plateau (44) it was still a drop from the previous years (86 and 66) plot results. Also, there were no indications of Aardvark below 6000 feet for the first time and they only featured a couple of times on the transect data. Signs were surprisingly scattered and widespread. Although lots of signs were not fresh, we found an unexpectedly high number of them. Fresher signs were found in Ndbera downhill from grid reference 032 192 on the 13th August. Aardvark numbers do seem to have declined this year.

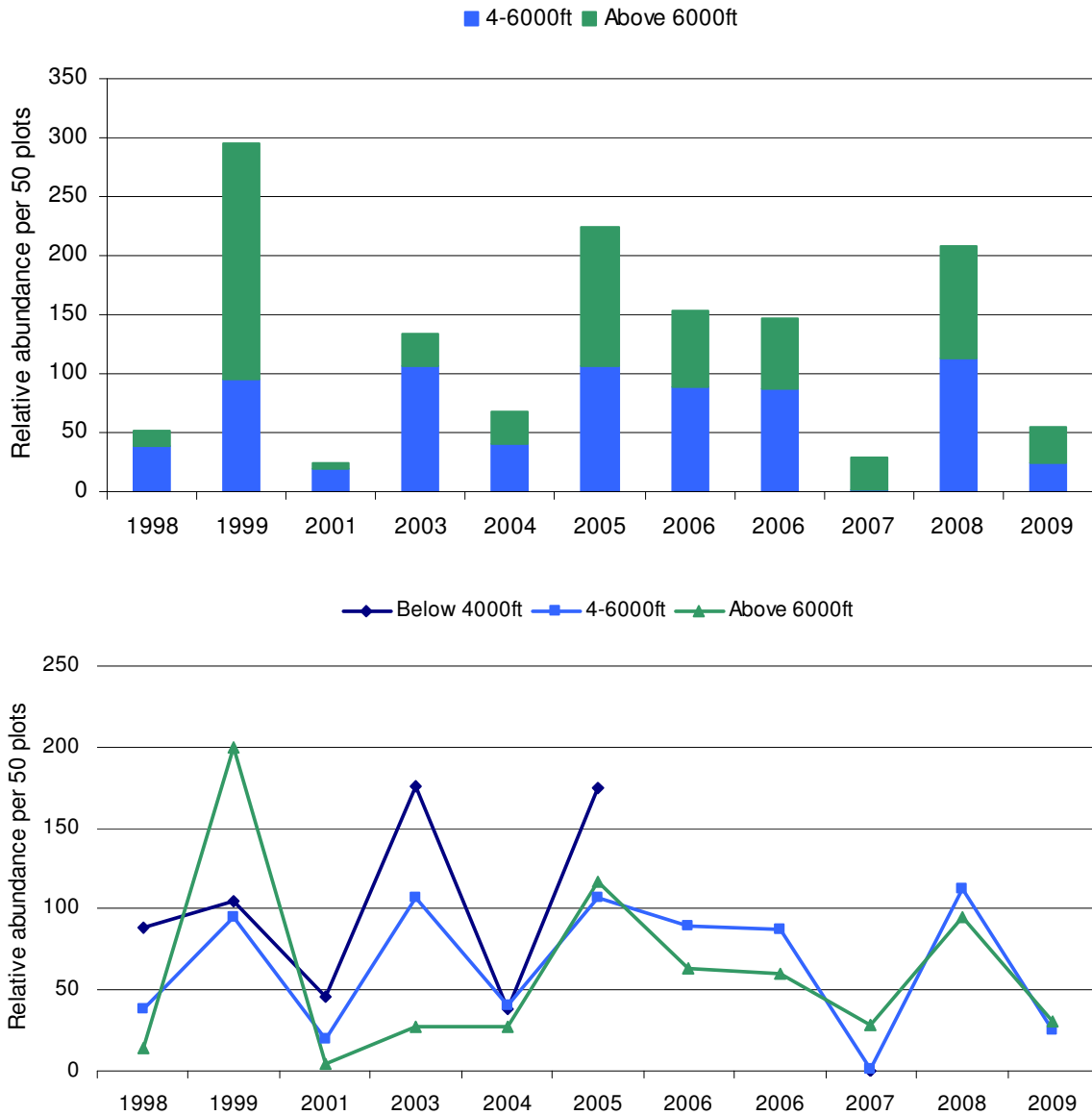
Figure 16a and 16b Relative abundance of Aardvark a) overall and b) by altitude



Mongoose

Widespread evidence but most common in Vitinthiza, found in 5/13 plots there. Mongooses are more characteristically found in open grassland rather than forests. Numbers are slightly down from last year, but not hugely and we did get a sighting in Vwaza. There is at least two species represented, the Slender Mongoose that feeds on termites and the Banded Mongoose.

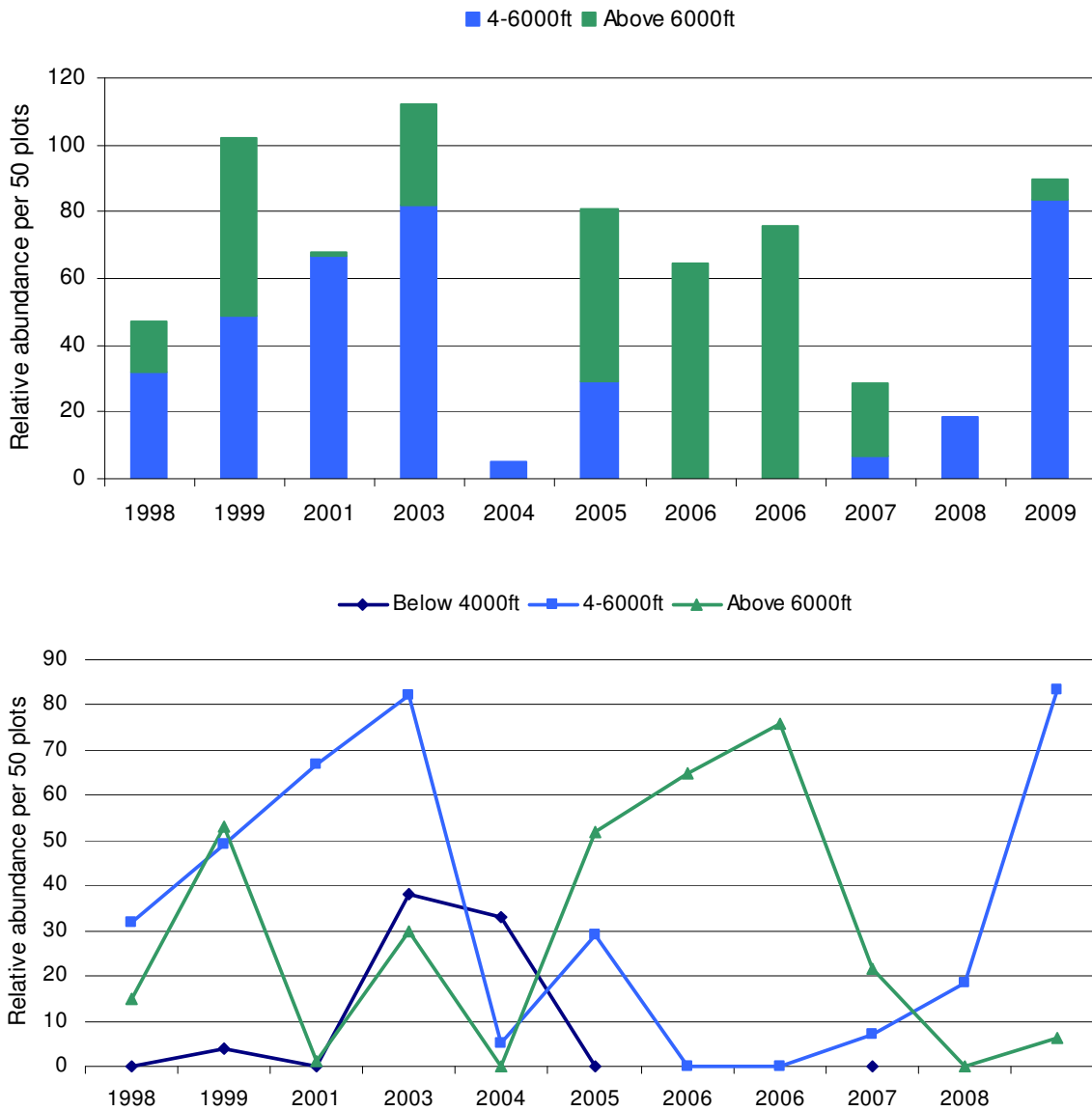
Figure 17a and 17b Relative abundance of Mongoose a) overall and b) by altitude



Hare

A few signs of Scrub Hare at Vitinhiza and Chisanga and Rock Hare found on transect on the slopes of Mount Futi along with Klipspringer, (up to 8000ft) as they share a similar habitat on rocky outcrops. Their populations are so variable, that a trend is difficult to identify.

Figure 18a and 18b Relative abundance of Scrub and Rock Hare a) overall and b) by altitude



EVIDENCE OF RARER SPECIES

Leopard

We found fresh Leopard droppings on more than one occasion, one in particular was very fresh, on distinctively prominent rocky outcrops. Sightings and prints from leopards are rare due to their elusive nature and soft tread. It does seem that leopards may have moved to the Vitinhiza area.

Blue Monkey

Two especially exciting sightings were, firstly, on a night drive when we were fortunate enough to see a pair of Honey Badgers and secondly when we managed to get a sighting of the rare Blue Monkey at 7355ft 10° 41.702', 33° 00.645'.

These mammals are very elusive and can normally only be briefly heard and not seen. We only had one recording at Vitinthiza but a good number of signs at Mwenembwe and Kasaramba with monkey signs found in 6/7 plots in rainforest slopes. Chisanga, Juniper and the

Mwenembwe Forest were the high altitude, wet forests where rare Blue Monkey was recorded. Unfortunately we did find the remains of a Blue Monkey that had been caught and killed by poachers, along with the snare that had caught it (see poaching report). But, encouragingly there was a sighting of a Blue Monkey on the expedition by one of our groups at Mwenembwe and many calls heard at this one location. Overall the Blue Monkey findings were positive.



The elusive Blue Monkey (photo taken at a wildlife reserve in Lilongwe) *Tim Wayman*



Otter prints were found both in the Nyika and Vwaza *Sarah Fowkes*

They are characteristically found in forests. We didn't find any signs in Vitinthiza but did in Kasaramba and Juniper.

Jackal

We also found a signs of Jackal activity and had a brief sighting at grid reference 032 192 on 13th August. Droppings were found in the higher habitats, on paths, away from the rocks that leopards leave droppings on.

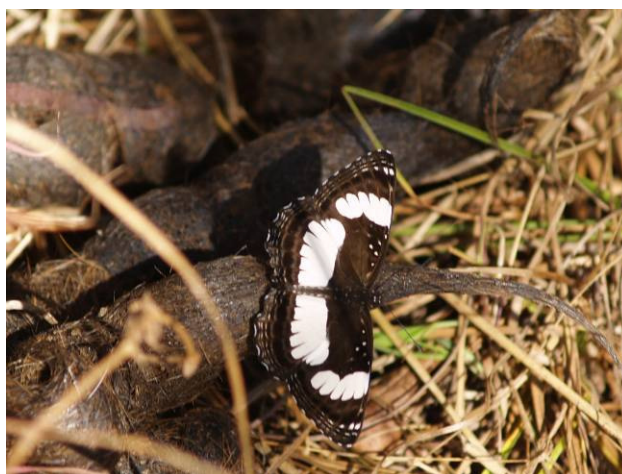
Some of this data wasn't quite significant enough to be counted in the statistical analysis, but it is still encouraging to see signs and sightings of the rarer mammals of the Nyika and Vwaza.

Tree Hyrax

The Tree Hyrax, a red data species, was found to have recently inhabited a den we came upon in a tree at 7839ft 10° 40.921', 33° 57.385'. Evidence was also found in Juniper forest consisting of another burrow and diggings on the 5th August at around grid reference 986 097.

Red Forest Duiker

A rare kind of Duiker, the Red Forest Duiker also seems to be on the rise as we found a good number of signs, especially droppings, which confirmed their presence. The results we collected this year in our plot data are the highest that have been recorded before for Red Forest Duiker.



Salts from Jackal droppings are quickly recycled by butterflies *Tim Wayman*

CONCLUSIONS

During the expedition we were lucky enough to see many different and interesting mammals. However, by looking at previous years records it becomes clear that there have been drops in abundance for a number of species. *Whilst there seemed to be a trend since 1998 of rising, dropping and then numbers rising again, there has been a dip this year.* There were decreases in Elephant, Eland, Roan Antelope, Reedbuck, Bushbuck, Common Duiker, Bushpig, Zebra, Jackal, Porcupine, Aardvark, Mongoose, Genet and Honey Badger numbers. This is a worrying number of species to decrease; some very extremely like Eland (with total signs of 141 and 161 over the previous 2 years on the Plateau but only 13 this year) and Roan Antelope (with total signs of 219 and 234 over the last 2 years on the Plateau and just 91 in 2009). This ties in convincingly with the increase in poacher activity we observed. In areas like Luselo, which are near scout camps, the species were more plentiful due to lower poacher activity. But at places like Kasaramba and Mwenembwe, which are very difficult to regularly patrol as they are far from scout camps, we found very few signs of mammals and there were hardly any sightings but a huge amount of poaching activity.

However we did get to see evidence of some of the rarer species that live in the Nyika and Vwaza National Parks. These less common species are very elusive and so tend to elude both scouts and poachers.

More data needs to be collected to establish how serious the drop in sign and sighting numbers is and whether it is carried over into the next year or whether it can be recovered with better protection. The surveys done in Kasaramba and Mwenembwe, where there is little previous data should be continued as the mammal numbers were very low due to high poaching activity. It is evident that the scout patrols are making a huge difference, but the data this year has shown how animals in areas without this protection suffer.

ACKNOWLEDGEMENTS

It has been a great privilege and pleasure to work alongside the professionals of the Malawian Department of National Parks and Wildlife (DNPW). We found them to be totally committed to protecting the flora and fauna of the Parks and extremely effective in all that they do. Many thanks for Marianne Overton for support in completing this report.



Hippo at Lake Kasuni in Vwaza

Sarah Fowkes

Appendix 1: 2009 Large Mammal Field Records																																	
Square Plot	Grid Ref	Date	Altitude ft	Tree Canopy	Bush	Grass cover	Bare earth	Marsh	Burnt	Slope/aspect	Plants	Print-holding quality	Elephant	Eland	Roan Antelope	Reedbuck	Bushbuck	Common duiker	Red Forest Duike	Bushpig	Leopard	Jackal	Baboon	Porcupine	Aardvark	Mongoose	Hare	Honey Badger	Blue monkey	Klipspringer	No. large mammal species		
Above 6000'																																	
Viinithiza (and Chisanga Sq 5)																																	
1	1 683 169	28.7	6200	5	30	80	20	0	20	15/SW	D F Pw Pt	m	6		4				11	4				1	4	3							7
	2 682 165		6200	0	0	0	0	0	90	5/S	D Bs Ls Pw	m	3	1	9	2			5	2				4	3	3	1	2				11	
	3 683 164		6225	0	90	100				20/NW	Pt Th H	p	16						1	7												3	
	4 685 169		6225	0	19	100	0	0	0	flat	D Th Pw	p	18							10				1		1						4	
	5 691 168		6350	40	50	50	0	0	5	flat	B M U	m	3	1	5	1	1	19	7			1	3	1		1	2					12	
2	1 729 183	29.7	6500	20	40	70	0	30	0	20/N	J Bs M E	m	3		1		1	3	4				14	1		5						8	
	2 721 185		6150	20	0	50	0	0	30	10/SW	A	m	3		7	1	2	7	9			1	6	3	2		1					11	
	3 720 185		6150	40	0	60	40	0	0	5/SW	Bs Th E	m	3		4	2	1	8	9				4	4		2		2				10	
	4 719 181		6050	5	10	60	0	55	50	10/SW	E Er Bs Ig	m	14		7	3			3	3				4	1							7	
3	3 747 168		6000	15	0	100	0	0	0	5/NW	Bs BI J F L M	m	4						4	9			3		2							5	
	4 747 167		6050	30	0	100	0	0	0	5/S	Bs BI J F L M	m	6	1	5				3	3			6		2							7	
5	1 754 353	02.0	6050	50	0	25	25	0	0	0	ScAaDpDbPtBsJg	m	76		1		41	5	5				3	2								7	
	2 753 353		6050	60	20	40	0	5	0	5/SE	Sc Bs Jg	m	9				28	2	4				3						1			6	
Juniper																																	
6	1 996 096	05.8	7800	0	0	100	0	15	0	5/W	E Pw Pt	m												7	2							7	3
	2 986 097		7800	0	5	5	0	0	90	10/W	E	m				1								8							1	3	
	3 978 095		7350	5	10	40	0	0	80	15/N	Pw	m					1	1					1							3		4	
7	1 991 101	06.8	7400	0	5	100	0	0	0	10/NE	Pa	m-p							4				2	1	3				1			5	
	2 993 105		7300	10	0	100	0	10	0	10/SW	Pa Th Sc Pt	m-p		2			3	1	3				4	1					3			7	
	3 994 106		7400	0	100	100	0	0	0	15/SW	Pt H	m-p					3						3									2	
	4 989 109		7350	0	5	100	0	0	0	15/S	Pw	m											3	3	3				3			4	
Kasaramaba																																	
8	1 074 125	08.8	7400	5	10	100	0	0	0	5/E	E As Th	m-p							3	4										3		3	
	2 072 124		7450	0	0	100	0	0	0	30/SE	Th Ss As H	m-p					3	1				1				1				3		5	
Mwenembwe																																	
9	1 082 192	10.8	7675	0	5	100	0	0	0	30/SE	Pt Hy	m-p							5	3	3									3		4	
	2 082 193		7675	0	0	100	0	0	0	30/NNE	Pt	m-p							1	2	1			3	3				3		6		
	3 086 195		7675	0	5	100	0	0	0	20/NE	Pa Pw H	m							1			1			2				3		4		
	4 086 191		7675	0	5	95	0	5	0	15/E	Pt C Lo	p							1				3								2		
10	1 096 195	12.8	7300	5	50	50	0	0	0	15/SE	E Pt H A Pa	m									1								3		2		
Ndbera																																	
11	1 047 191	13.8	8000	0	5	100	0	0	100	20/NE	Pw	g					2	3	3				1									4	
	2 032 192		7750	0	0	90	0	0	10	20/SW	Pt K	m			1	9							1	3								4	
12	1 044 187	3.09	8050	0	5	100	0	0	100	10/W	Pt	m					3	3					1	2								4	
	2 045 187		8050	0	5	100	0	0	100	5/W	Pt	m					2	1															2
Chisanga below 6000'																																	
4	1 738 365	01.0	5750	10	0	80	0	70	0	15/NE	Bt Sy X	p							1				3	1					9			4	
	2 743 361		5800	50	0	60	60	0	0	10/SE	U M E J	m							1	8	10		3									4	
	3 745 356		5750	40	0	60	50	0	0	20/N	P U Is Bt	m									4		3	2		2						4	
Viinithiza below 6000'																																	
3	1 743 165	30.7	5900	20	10	80	0	5	0	20/E	Th Pw	m	6		5		4	3	5	2			1	5	1						9		
	2 744 165		5900	20	5	50	0	15	0	15/SW	My C Rh	g-p			3		4	4	3	3			3				1				7		
	5 739 172		5950	0	0	100	0	0	0	10/S	B M U	p	5	3	7	5	1	3	5				1	1		1						10	
Summary																																	
Relative abundance scores per 50 plots (n=37) All results													236	11	80	42	127	143	15	159	12	5	77	97	38	30	19	5	39	11	18		
Relative abundance scores per 50 plots (n=31) Above 6000ft													265	8	71	42	135	140	18	147	6	6	69	102	44	31	6	6	47	13	18		
Relative abundance scores per 50 plots (n=6) Below 6000ft													92	25	125	42	83	158	0	225	42	0	117	75	8	25	83	0	0	0	13		

Key to Appendix 1

Square = Random kilometer square, Plot = 100m x 100m

Print-holding quality g good, m medium, p poor

Vegetation is recorded in % cover, in 25% intervals (eg 100 indicates 76-100% cover)

Plants

Aa <i>Aframomum angustifolia</i>	J <i>Jubernardia paniculata</i>
A <i>Aeschynomene oligophylla</i>	Jg <i>Jubernardia globiflora</i>
As <i>Agarista salicifolia</i>	K <i>Kniphofia</i> spp.
B	L <i>Loudetia simplex</i>
Bl <i>Brachystegia longifolia</i>	Lo <i>Lobelia mildbreadii</i>
Bs <i>Brachystegia speciformis</i>	M <i>Monetes africana</i>
Bt <i>Brachystegia tamarindoides</i>	Me <i>Melinis</i> spp.
C <i>Cyperus</i> spp.	My <i>Myrica humilis</i>
D <i>Droogmansia pteropus</i>	P <i>Parinari curatellifolia</i>
Db <i>Dombeya burgessiae</i>	Pt <i>Pteridium aquilinum</i>
Dp <i>Dissotis princeps</i>	Pw <i>Protea welwitschii</i>
E <i>Erica benguelensis</i>	Pa <i>Protea angolensis</i>
Er <i>Eriosema</i> spp.	Rh <i>Rhamnus prenoides</i>
Eg <i>Eragrostis</i> spp.	Sy <i>Syzygium guineense</i>
F <i>Faurea rochetiana</i>	Sc <i>Syzygium cordatum</i>
H <i>Helichrysum</i> spp.	S <i>Satureja</i> spp.
Hy <i>Hygenia abyssinica</i>	Th <i>Themeda triandra</i>
I <i>Inula glomerata</i>	U <i>Uapaca robynsii</i>
Is <i>Isoberlinia angolensis</i>	X <i>Xerophyta</i> spp.

Average number of species per plot for each habitat is included in the far right column

Appendix 2: 2009 Transects, sightings only

Total distance in Nyika = 139.2km

Total area surveyed = 236.64km²

Species	Date 2009	Length of transect (km)	Number of individual animals	Distance from transect line	Distance visible from the transect	Location	Notes	Animals per km ²
<u>Transect 1 Vehicle</u>								
	27-Jul	5.9	Thazima Gate 723169 to Luselo basecamp 692167, nr. Vitinithiza					
Common Duiker			1	10	30	713155		0.21
Baboon			14	10	30	713155	4 young	2.99
Roan Antelope			20	10	600	712149		4.27
Bushbuck			1	400	600	712149		0.21
Bushbuck			1	50	2500	705157	Female	0.21
Roan Antelope			2	400	1000	709153	1 m, 1 fe	0.43
Average visibility in m/km ²					793		5	
<u>Transect 2 Foot</u>								
	29-Jul	4.2	Lusello basecamp 723169 start and finish					
Reedbuck			2	600	900	722173	1 male 1 female	
Common Duiker			2	10	900	728178	1 male 1 female	
Reedbuck			1	400	2000	737173		
Baboon			40	0	1500	729181		
Bushbuck			3	0	1500	723184		
Common Duiker			1	0	1500	723184		
Eland			16	2000	2500	North		
Roan Antelope			2	700	2500	North		
Bushbuck			1	700	2500	North		
Klipspringer			1	100	2000	733185		
Roan Antelope			21	1500	5000	712172	5 young	
<u>Transect 3 Foot</u>								
	30-Jul	5.1	Lusello basecamp 723169 start and finish					
Reedbuck			4	1000	3000	736175		
Bushbuck			1	1000	3000	736175	Male	
Common Duiker			1	0	20	735165	Young	
Roan Antelope			2	2000	2000	738162		
Bushbuck			1	500	1000	736180		
Bushbuck			1	500	1000	743161		
Roan Antelope			1	1000	1500	7441265		
Reedbuck			2	200	300	728175		
Bushbuck			1	0	100	725176		

Appendix 2 Continued: 2009 Transects, sightings only

Species	Date 2009	Length of transect (km)	Number of individual animals seen	Distance from transect line	Distance visible from the transect line	Location	Notes
<u>Transect 4 Vehicle</u>							
	03-Aug	40	Chisanga	753354	to Juniper Forest	068130	
Common Duiker			1	0	200	750318	
Bushbuck			1	30	1500	790198	
Eland			4	500	500	825307	1 young
Roan Antelope			1	20	300	825303	
Roan Antelope			10	10	50	832309	
Reedbuck			2	500	600	830305	1 male 1 female
Roan Antelope			1	500	600	830305	1 young
Common Duiker			2	30	1500	847308	
Reedbuck			1	30	1500	847308	
Zebra			4	100	1500	847308	
Reedbuck			8	100	1500	847308	
Common Duiker			2	200	2500	858306	
Warthog			2	0	3000	909280	
Roan Antelope			1	0	3000	922255	
Warthog			1	100	3000	929249	
Warthog			4	300	4000	943241	1 young
Reedbuck			3	500	2500	946244	
Warthog			1	300	3000	953246	
Common Duiker			1	300	3000	953246	
Eland			3	1500	3000	964236	
Reedbuck			3	300	3000	964236	
Common Duiker			1	100	3000	964236	
Common Duiker			2	0	3000	955226	
Reedbuck			2	80	1500	958215	
Reedbuck			7	300	1500	958215	
Reedbuck			3	0	2000	989192	
Reedbuck			2	50	3000	993197	1 male 1 female
Reedbuck			2	300	2000	O27186	
Reedbuck			1	200	3500	O42166	
Warthog			2	200	2000	O43152	
Reedbuck			2	400	1000	O38145	
Reedbuck			3	10	2000	O39134	
Reedbuck			3	20	3000	O25142	
Reedbuck			2	150	2500	O19140	
Roan Antelope			1	150	2500	O19140	
Reedbuck			4	150	1000	OO4134	
<u>Transect 5 Vehicle</u>							
	07-Aug	15	Juniper Forest basecamp	068130	to Kasaramba		
Reedbuck			5	0	80		

Appendix 2 Continued: 2009 Transects, sightings only

Species	Date 2009	Length of transect (km)	Number of individual animals seen	Distance from transect line	Distance visible from the transect line	Location	Notes
Transect 6 Vehicle							
	09-Aug	8	Kasaramba to Ndembera				
Reedbuck			4	200	1000		
Reedbuck			2	0	1500		
Reedbuck			1	100	2000		
Reedbuck			2	0	1500		
Transect 7 Vehicle							
	14-Aug	26	Ndembera to C Estimate				
Reedbuck			1	50	2000		
Reedbuck			3	200	2000		
Reedbuck			5	200	2000		
Warthog			1	200	2000		
Warthog			5	200	2000		
Eland			2	600	2000		1 female 1 young
Reedbuck			4	200	2000		1 male 2 female
Roan Antelope			1	300	2000		1 male
Roan Antelope			1	50	2000		1 male
Transect 8 Vehicle							
	14-Aug	35	Chilinda to Kilc Estimate				
Reedbuck			1	50	10		1 female
Reedbuck			5	0	10		1 male 4 female
Scrubhare			1	0	10		
Honeybadger			2	0	10		1 male 1 female
Transfer to Vwaza							
Transect 9 Foot							
	18-Aug	5	Vwaza Sanctuary 425692 east along fence to R. Luwewe				
Reedbuck			2	200	200		
Impala			8	200	200		
Roan Antelope			3	0	50		
Common Duiker			1	0	50		
Reedbuck			4	100	200		
Reedbuck			2	300	400		
Reedbuck			3	200	400		
Puku			6	200	400		
Hartebeest			6	400	400		
Warthog			6	400	400		
Common Duiker			1	200	400		
Average visibility in m					282		
Transect 10 by foot							
		40	Krr Kawiya Scout Camp 560 974 to Chametete Pool & back				
Bushbuck			1	0	10		
Average visibility in m					200	8km ² total area	

Appendix 3 Summary of large mammal data July/Aug 1998-2009 (Relative abundance scores per 50 plots)

Lowland below 4000ft	Eleph	Eland	Roan	Kudu	Reedl	Bushl	Comm	Gryst	Red	F	Buffal	Warth	Bushl	Zebra	Leopd	Serva	Hyael	Jacka	Civet	Babor	Porcu	Otter	Aardv	Mong	Hare	Gene	Hone	Verve	Mont	Klipsf	Species
1998 Sawi (40 plots)	63	4	3	66	0	59	210	23	0	39	0	164	0	0	14	25	20	23	71	9	0	46	88	0	0	0	0	0	0	0	17
1999 Sawi (50 plots)	14	7	26	5	0	18	204	0	0	3	12	84	0	0	0	2	12	2	88	0	0	13	105	4	0	0	0	0	0	0	15
2001 Sawi (25 plots) 4-4,500ft	6	30	28	0	0	0	176	0	0	0	0	68	0	0	0	0	0	10	166	0	0	16	46	0	0	0	0	0	0	0	9
2003 Sawi (25 plots)	2	20	4	46	6	164	504	22	0	20	168	2	2	6	2	0	0	324	2	6	26	176	38	0	10	0	0	0	0	0	21
2004 Mpanda (10,5plots) 3-4,000ft	0	0	0	0	0	29	138	10	0	0	24	0	10	0	5	0	0	167	5	0	0	38	33	0	0	0	0	0	0	0	10
2005 Chisanga (10 plots) 4-5,000ft	0	0	0	0	0	114	445	0	0	0	160	0	0	0	0	0	0	10	215	0	0	10	175	0	25	0	5	0	0	8	
2007 Sawi (12 plots)	0	0	0	25	0	92	342	138	0	0	288	0	0	0	13	0	0	200	63	4	21	0	0	0	0	0	0	0	0	10	
Slopes 4-6,000ft	Eleph	Eland	Roan	Kudu	Reedl	Bushl	Comm	Gryst	Red	F	Buffal	Warth	Bushl	Zebra	Leopd	Serva	Hyael	Jacka	Civet	Babor	Porcu	Otter	Aardv	Mong	Hare	Gene	Hone	Verve	Blue	Klipsf	Species
1998 Chipome (50 plots)	78	51	87	17	0	36	108	3	0	43	10	79	0	6	16	8	24	8	2	3	11	16	38	32	7	0	0	0	0	0	22
1999 Chipome (25 plots)	83	144	24	70	1	84	430	0	2	72	59	115	0	0	1	20	32	3	39	1	4	19	95	49	1	0	0	0	0	0	22
2001 Chipome (30 plots)	82	8	40	13	0	17	270	20	0	23	0	57	2	0	0	10	0	2	53	0	0	3	20	67	0	0	0	0	0	0	16
2003 Chipome (50 plots)	37	24	30	52	6	68	446	81	0	25	0	206	0	2	2	0	13	90	12	3	5	107	82	4	0	0	0	0	0	0	22
2004 Mpanda (43,5plots)	3	9	8	24	0	47	106	2	0	5	0	134	0	0	2	5	7	159	30	0	6	40	5	0	0	0	0	0	0	0	17
2005 Chisanga (34 plots)	0	0	1	0	4	137	332	0	0	0	163	0	1	0	0	0	0	24	237	1	0	9	107	29	1	10	1	4	0	16	
2006 4 sites (14 plots)	4	0	0	0	0	161	154	0	14	0	0	179	0	0	0	4	0	214	189	0	18	89	0	0	25	0	0	26	11	11	12
2006 4 sites (19 plots)	3	0	0	0	0	142	203	0	11	0	0	168	0	0	0	3	0	192	168	0	32	87	0	0	26	11	8	8	13	13	
2007 Chipome (38 plots)	62	57	8	45	0	91	511	57	3	1	0	211	0	3	3	8	3	0	180	28	1	16	1	7	1	0	0	0	0	0	21
2008 Runyina Valley (67 plots)	147	137	84	0	159	229	565	0	0	0	0	372	1	1	1	4	0	1	143	151	1	35	113	19	1	4	0	0	3	21	
2009 Chisanga & Vitihriza (6 plots)	92	25	125	0	42	83	158	0	0	0	0	225	42	0	0	0	0	0	117	75	0	8	25	83	0	0	0	0	0	0	
Plateau 6-7,500ft	Eleph	Eland	Roan	Kudu	Reedl	Bushl	Comm	Gryst	Red	F	Buffal	Warth	Bushl	Zebra	Leopd	Serva	Hyael	Jacka	Civet	Babor	Porcu	Otter	Aardv	Mong	Hare	Gene	Hone	Verve	Blue	Klipsf	Species
1998 Chipome	14	78	38	0	33	20	12	0	3	0	47	39	2	2	2	14	9	2	0	16	6	46	14	15	1	0	0	0	0	0	21
1999 Chipome	97	158	24	75	1	102	634	0	2	75	71	199	0	0	1	22	44	5	127	1	4	32	200	53	1	0	0	0	0	0	22
2001 Chipome (25 plots)	10	9	2	0	9	1	2	1	1	0	0	67	0	2	0	1	0	0	0	0	0	51	4	1	0	0	0	0	0	0	14
2003 Chipome (50plots)	29	40	0	0	26	59	73	10	0	0	0	118	0	7	0	0	5	4	0	50	1	84	27	30	0	0	0	0	0	0	15
2004 Mpanda (17plots)	0	0	27	14	0	150	9	0	0	0	0	123	0	0	0	0	0	0	77	18	0	5	27	0	0	5	0	0	0	0	10
2005 Chisanga (29 plots)	162	212	202	0	183	86	164	0	0	0	53	174	79	12	2	7	0	2	33	145	0	9	117	52	7	9	5	5	5	22	
2006 4 sites (34 plots)	12	187	168	0	110	187	199	0	0	0	0	157	56	1	3	4	6	1	19	103	0	15	63	65	6	19	6	49	22		
2006 4 sites (29 plots)	14	219	197	0	129	203	174	0	0	0	0	160	66	2	3	5	7	2	0	102	0	5	60	76	7	17	0	57	20		
2007 Plateau (35 plots)	54	141	219	0	284	33	174	0	0	0	120	60	63	13	1	16	10	1	0	119	0	86	29	21	1	11	0	0	0	20	
2008 Plateau (22 plots)	155	161	234	0	132	177	239	0	0	0	7	198	25	2	0	2	14	0	34	202	0	66	95	0	2	20	0	0	0	18	
2009 South plateau (31plots)	265	8	71	0	42	135	140	0	18	0	0	147	0	6	0	0	6	0	69	102	0	44	31	6	0	6	0	47	13	18	
2009 Combined data (37 plots)	236	11	80	0	42	127	145	0	15	0	0	159	0	12	0	0	5	0	77	97	0	38	30	19	0	5	0	39	11	18	

POACHING REPORT

Ben Chessum and Sarah Sandon

INTRODUCTION

Biosearch Expeditions has been visiting Nyika Plateau since 1997, bringing a team from the UK to work with scouts from the Parks and Wildlife Department. In recent years the expedition has also included the Vwaza National Park. Poaching data has been gathered on Nyika each year and in 2009 the team has visited:

Luselo
Chisanga Falls
Juniper Forest
Kasaramba
Ndembera
Mwenembwe.

In Vwaza the team were based at Kawiya Camp and at Kasuni Lake.

Data collected from Nyika

Luselo data

Tuesday 28th July 2009

Smoke from fire below Mwanda peak, thought to be poachers' fire.

POACHING EVIDENCE

Location details are in Table1. Every sign of poachers was photographed but one film was lost in the post in the UK before processing.



Chisanga (Ref 1) Poached beehive entrance in tree trunk, cut open and blocked with a rock.
Ben Chessum



Chisanga (Ref 5) Fishing rods (left) and snare pegs (below)
Ben Chessum





Kasaramba (Ref 1)
Poachers' snare set ready on forest path (above)
Richard with the day's collection of 11 snares (below)

Ben Chessum





Mwenembwe (Ref 1) Poacher fire at forest edge
Sarah Sandon



Ndembera (Ref 4) Digging for theft of orchids
Ben Chessum



Mwenembwe (Ref 16) Broken sole of poacher's shoe
Ben Chessum

POACHING RECORDS

Place	Date '09	Ref	Evidence	Map Ref	GPS Ref	Altitude
Luselo	27-Jul	1	Smoke from fire below Mwanda peak, thought to be poachers' fire.	distant		
Chisanga	31-Jul	1	Fire to smoke out bees, about 3 weeks old	749 355	S10° 32.273' E33° 41.097'	5904'
		2	Fishing sticks and bark removed for string	742 360	S10° 31.878' E33° 40.776'	5532'
		3	Fire to smoke out bees from trees for honey	749 355	S10° 32.275' E33° 41.088'	5933'
	01-Aug	4	Footprints by the river, bare foot	760 352	S10° 32.286' E33° 41.652'	5966'
		5	Fishing rods and small snare trap sticks, broken by hand not knife, 1 wk old.	964 358	S10° 32.041' E33° 41.932'	6000'
Juniper	04-Aug	1	Remains of campfire on top of Mount Futi	986 097	S10° 44.196' E33° 54.105'	7988'
	05-Aug	2	Used snare trap	988 110	S10° 45.638' E33° 54.505'	7324'
		3	3 kms north of Mount Futi, 5 wire snares within radius of 50 m	988 110	S10° 45.625' E33° 54.548'	7383'
		4	Old poachers' stick for snare	990 104	S10° 45.667' E33° 54.401'	7400'
		5	Poachers fire, 6 maize outer leaves, wind shelter of grass and sticks, 2-3 months old, inside edge of	988 107	S10° 45.531' E33° 54.239'	7310'
Kasaramba	8th Aug	1	Poachers wire snare – 11 for the day (see below) on edge of forest	070 125	S10° 44.733' E33° 58.754'	7634'
		2	Poacher snare with 6 wire snares set within forest	070 125	S10° 44.661' E33° 58.905'	7634'
		3	Poacher trail with 2 wire snares set in forest	070 125	S10° 44.650' E33° 58.943'	7295'
		4	On grassy slope between forest 13, 1 poacher wire snare set to the east of the clearing	074 125	S10° 44.665' E33° 59.011'	7216'
		5	Poachers wire snare and fresh signs of broken vegetation from the day before	074 125	S10° 44.687' E33° 59.073'	7087'
		6	Blue monkey hair remains and remains of trap, about 1 month old.	072 123	S10° 44.684' E33° 58.894'	7413'
	08-Aug	7	Poachers drying rack made of cut saplings	075 122	S10° 44.695' E33° 58.909'	7418'
		8	12th wire snare in Kasaramba	077 122	S10° 44.687' E33° 59.073'	7087'
		9	Orchid diggings on the ridge below Kasaramba viewpoint	069125	S10° 44.561'	7690'

POACHING RECORDS CONTINUED

Place	Date 2009	Ref	Evidence	Map Ref	GPS Ref	Altitude	
Mwenembwe	09-Aug	1	Campfire and evidence of digging up orchids – about 1 week old	078 192	S10° 41.747'	7997'	
					E33° 59.268'		
	10-Aug	2	Poachers path with foot print of 3 people and 1 dog (see next 2)	082 191	S10° 41.406'	7852'	
					E33° 59.931'		
		3	100 metres further on - footprints	083 191	S10° 41.434'	7894'	
					E34° 00.084'		
		4	1 dog print	095 182	S10° 41.501'	7920'	
					E34° 00.290'		
		5	Orchid bulb digging – 1 month old – and fire remains	104 189	S10° 41.140'	7880'	
					E34° 00.559'		
	6	Dog barking heard 1km away at 9.45 a.m	104 189	S10° 41.140'	7880'		
				E34° 00.559'			
	7	2 campfires, 3 cut trees and diggings for orchids	106 187	S10° 40.775'	7500'		
				E34° 00.587'			
	8	Richard and Kenneth found villagers cutting native species of wood within the park, wood felled previously	e.119184	S10° 41.34'	7250'		
E34° 1.39'							
11-Aug	9	Poachers resting place by path overlooking forest looking down	089 198	S10° 41.557'	7871'		
				E34° 00.300'			
	10	Illegal burning – Junju village in sight – about 2 weeks old	105 186	S10° 41.616'	7778'		
				E34° 00.416'			
	11	Fire wood, failed fire and cigarette stub	104 183	S10° 41.670'	7641'		
				E34° 00.509'			
	12	On edge of wood poachers trail and fire – about 2 months old	105 183	S10° 41.677'	7526'		
				E34° 00.579'			
13	Few yards further down on edge of same wood, fire 3-4 wks old	106 186	S10° 41.676'	7460'			
			E34° 00.595'				
14	Through wood, root collecting from tree called “muwawani” in Tumbuka	106 186	S10° 41.674'	7448'			
			E34° 00.631'				
15	A few steps higher a big root cutting that killed the tree; also a campfire on path, remains of nsima, plastic bag and other food waste.	106 186	S10° 41.674'	7448'			
			E34° 00.631'				
Path from Mwenembwe to Ndembera	11-Aug	16	Part of poachers shoe at edge/start of illegal burning 2-3 weeks old	970 182	S10° 41.652'	7925'	
					E33° 53.598'		
				End of illegal burning	975 183	S10° 41.759'	7979'
						E33° 59.331'	
				Match box found between start and end of burning		S10° 41.748'	7905'
E33° 59.590'							
			Empty cooking oil bottle	065 180	S10° 41.481'	8041'	
					E33° 57.929'		
Ndembera	12-Aug	1	2 lots of orchid digging	050 187	S10° 41.122'		
					E33° 57.413'		
				Poachers stick burnt	038 193	S10° 40.881'	7738'
						E33° 56.968'	
				Pieces of cut sticks in woodland	038 193	S10° 40.815'	7785'
						E33° 56.898'	
				4 orchid diggings	026 182	S10° 41.401'	8080'
						E33° 56.869'	

CONCLUSIONS

Recent Improvements

There has been an increase in scout numbers

The road to Kasaramba has been repaired

Improved collaboration between Zambian and Malawian parks authorities

Successes

The forests are mainly in good condition and well worth continuing protection to ensure diversity of their ecology

Juniper Forest is well protected as evidenced by the finds of rare species that the Biosearch team did not find anywhere else, e.g. slow moving reptiles and tortoises which are badly affected by fire

Scout skills and resources

The scouts working with the Biosearch team are very knowledgeable and experienced and excellent trackers. They support the parks department well.

The scouts use their skills and experience as well as possible within the resources available.

The scouts understand the need to prevent poaching and environmental deterioration through education of the community together with reducing cases of poaching through law enforcement.

RECOMMENDATIONS

Team with new staff could work more with experienced scouts to get to know the area well, including where to camp, where poachers are likely to camp, where common paths are from outside the parks, where the common poaching places are.

Increased monitoring of known poaching hotspots by availability of vehicles to take teams into the field for law enforcement

Increased protection of forests from burning getting out of control

Provision of bicycles (mountain bikes) for teams/law enforcers

Because of the evidence of much poaching in the southeast corner of the park it would be ideal to have a further patrol base there when resources become available. This area is remote and difficult to monitor from the existing scout camps.

We wish the Law Enforcement adviser Gervas Thamala well. He has a big job; balancing supporting the scouts to do their jobs; making the best use of limited resources and working in partnership with community teams

AMBUSHED AND CAUGHT

Two men were arrested for poaching, to the north east of Nganda Peak. They were found with the meat of Roan Antelope and Bushbuck, which had been dried. They were also in possession of a locally made shot gun, 3 spears, 3 axes, knives and matches and lots of bullets made of battery lead and 3 cooking pots.

Arrested poachers Yohani
Msiska & Mateyo Msiska
(original home Livingstonia)
Ben Chessum



ECOLOGY OF FOREST PATCHES

Christopher J Clayton and Steven Mphamba

ABSTRACT

Fourteen forests on the Nyika Plateau (circa 10°-11°S and 33-34°E) were investigated and the species and tree diameters recorded. Altitudes ranged from 5900ft to 7200ft In the Chisanga Falls area; Juniper Forest; and on the eastern escarpment, the Mwenembwe Forest area below Kasaramba Peak and east of Ndembera Peak. All forests were found to differ not only between the three areas but within them as well, indicating all forest patches have an important conservation value.

INTRODUCTION

The botany of the Nyika has been investigated by a number of authors over the years, especially in connection with the Biosearch Expeditions between 1996 and 2009 (Overton 1997-2009). Much less has been done on the ecology of the forest patches and still less in the Mwenembwe area. A resume of the botanical work on the Nyika up to 2001 is recorded in the work of the South African Botanical Diversity Network (Sabonet 2005). This includes accounts of 1,817 species recorded in the Nyika National Park.

Plant collections from the Chisanga and Juniper Forests include a number of authors, notably Dowsett-Lemaire (White, Dowsett-Lemaire and Chapman, 2001). Collections were probably made from the Mwenembwe Forest area by Leonard Brass as part of his expedition in 1946 (pub.1953). Jean Poweck, a prolific collector and teacher at Mzuzu, collected between 1959 and 1978, and John Ball between 1965 and 1968. In 1981, Frank White had a brief visit which included the Mwenembwe Forest Area. The single most comprehensive botanical expedition was done by Sabonet (21 Mar-10 April 2000), though without visiting Chisanga or Mwenembwe.

The most comprehensive study of rainforests on the Nyika was published by Dowsett Lemaire (1987). Biosearch published two forest ecology papers from other parts of the Nyika National Park (Herd 2003 and 2009). There are numerous evergreen forest patches on and far below the Nyika plateau; this study only covers fourteen forests in three areas of the southern side of the Park.

The Nyika National Park is home to a number of different key habitats, included in this study. (Herd et al 2003) At lower altitudes (typically around 4-5000ft) there is found large swathes of *Brachystegia* woodland with a more tropical climate. At higher points in the park (edging towards 6-7000ft) are the characteristic rolling hills of the Nyika high plateau, with a cooler and often moist climate, the dominant species are usually those of the grasses *Themeda triandra*, *Loudetia simplex* and *Exotheca* spp. The Nyika plateau also hosts small patches of evergreen forest that occur around the park in two distinct habitats. The first is the riverine forest found along the sides of streams and along gullies in the landscape; the other kind is the montane forests normally found on the steep sides of valleys. The Eastern escarpment of the plateau receives higher rainfall from the prevailing south easterly winds. These forests were festooned with lichens, epiphytes and rich growth characteristic of rainforests.

The aim of this investigation was to assess the ecology of these evergreen forest patches and to find out whether the ecology of the forests differ from one another and consider if this is dependent on an external influence, such as altitude.

METHOD

The tree survey made up the main part of this study. Representative forests were selected. The perimeter of the forest was examined and any species seen was recorded as an 'edge plant'. Then inside the forest a similar list of species was constructed under the headings of "big trees, shorter trees, under-story plants, parasitic plants and climbers". Once species lists in the forest were established, two or three 4 x 4m metre squares, depending on the size of the forest, were randomly placed and the circumference of all trees in the square was taken at breast height using a flexible tape measure. To convert the circumference to a diameter the following equation was used:

$$\text{Diameter} = \frac{\text{Circumference}}{\pi}$$

The different tree species were identified by Malawian botanist, Steven Mphamba from the Forestry Research Institute of Malawi (FRIM). Simultaneously, the other team would perform mammal and bird surveys in or adjacent to the forest being surveyed, the methodology for which is contained elsewhere within this report. Birds were identified with the aid of Medland (1994), Newman (1983), and Newman et al (1992). Sweep netting of the under-story plants was also performed to collect insects, which were identified later by entomologist Ray Murphy F.R.E.S.

Site Locations

The study was conducted at three main sites in the national park; four forest patches were surveyed near the base camp at Chisanga, on the West side of the park, near the Zambian border. Seven forest patches close to Juniper Forest and three from Kasaramba, the latter two sites are in the south-eastern part of the park. (See the map section at the beginning of the report for further details)

RESULTS

Table 1 Diameter of trees in each forest studied
(Each square is 4m x 4m)

Forest	Altitude	No. of Species	Average number of species per square (diversity)	Average trees per square (density)	Diameter				
					Average per square	Max in square	Min in square	Median in square	
1	5966	20	10	2	16.1	40.1	1.3	12.1	
2	6000	17	11	5	17.1	27.4	3.2	18.1	
3	6012	19	9	1	44.8	75.1	19.7	22.9	
4	6023	18	6	5	14.8	20.1	8.9	16.8	
5	7572	31	7	13	6.2	16.9	1.9	5.4	
6	7490	21	7	7	13.8	45.4	1.6	10.2	
7	7536	23	8	6	8.2	24.8	1.3	4.9	
8	7238	28	8	6	12.2	81.5	1.3	4.9	
9	7407	25	8	8	13.1	60.5	1.3	4.1	
10	7324	35	8	5	17.6	62.7	1.6	12.7	
11	7310	31	8	7	12.1	42.6	1.9	6.7	
12	7413	30	8	7	11.6	56.0	2.2	5.1	
13	7216	35	12	5	9.0	19.7	2.9	8.0	
14	7204	30	7	7	7.1	20.7	2.3	4.6	

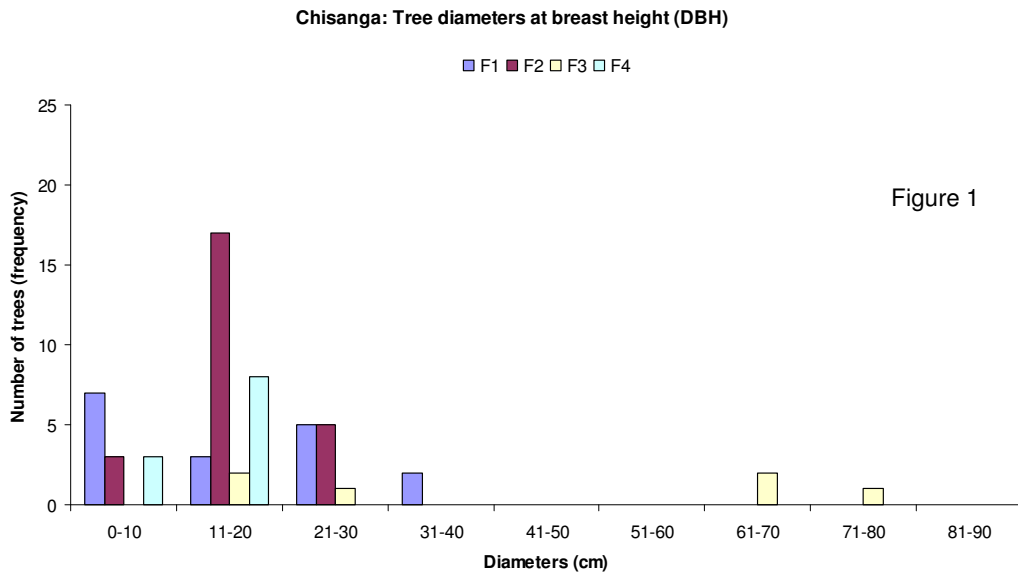


Figure 1

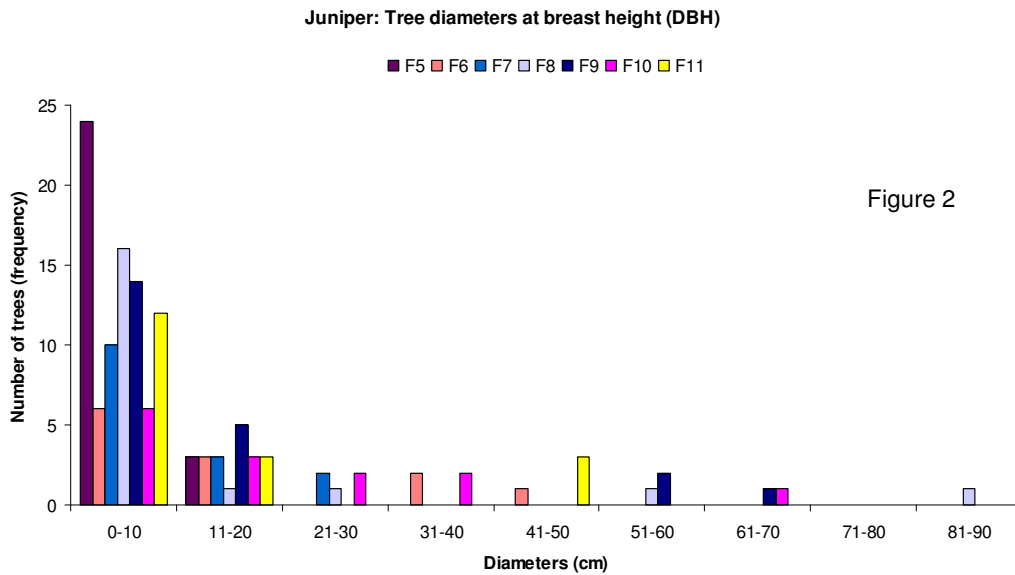


Figure 2

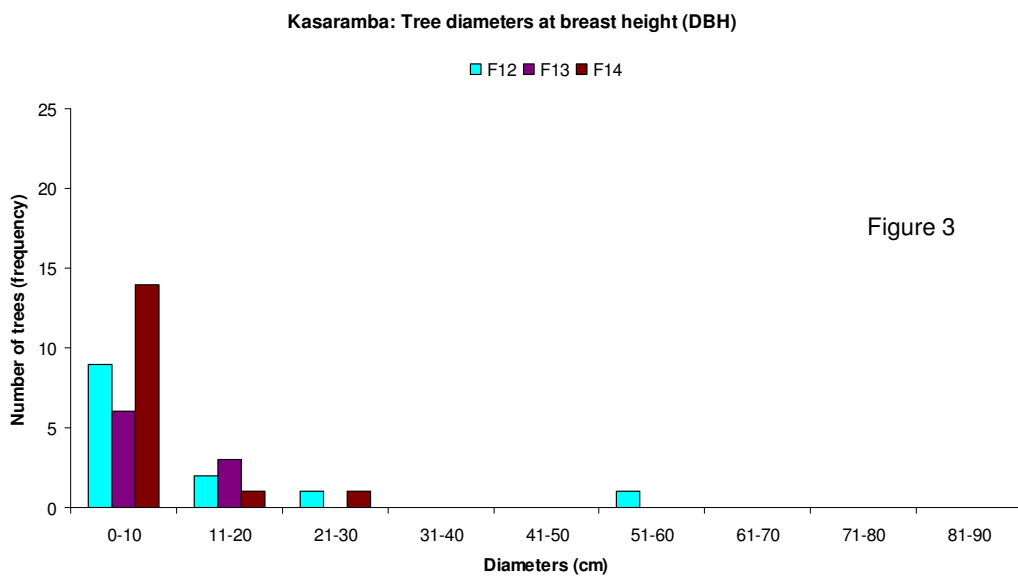


Figure 3



Above: One of the many streams running through Forest 1, note the multi-trunked *Syzygium cordatum* at the tip of the "island"
Photos by Tim Wayman

Below Left: A Bushbuck (*Tragelaphus scriptus*) a small forest-dwelling antelope, evidence of which was found in a number of surveyed forests

Below Right: The surveying of forest plant species in the Chisanga area



Figure 4 Density of forest as measured by the average number of trees per plot

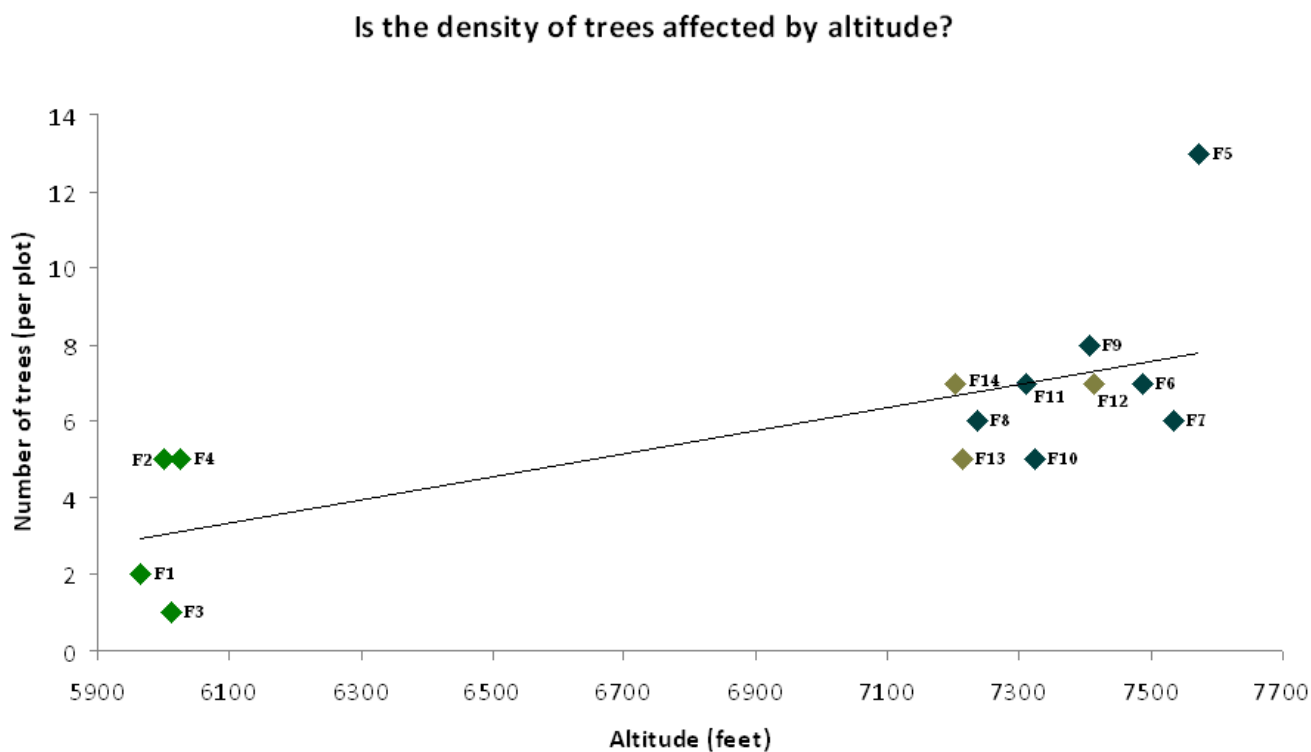


Figure 5 Species Diversity, measured as the average number of species per plot

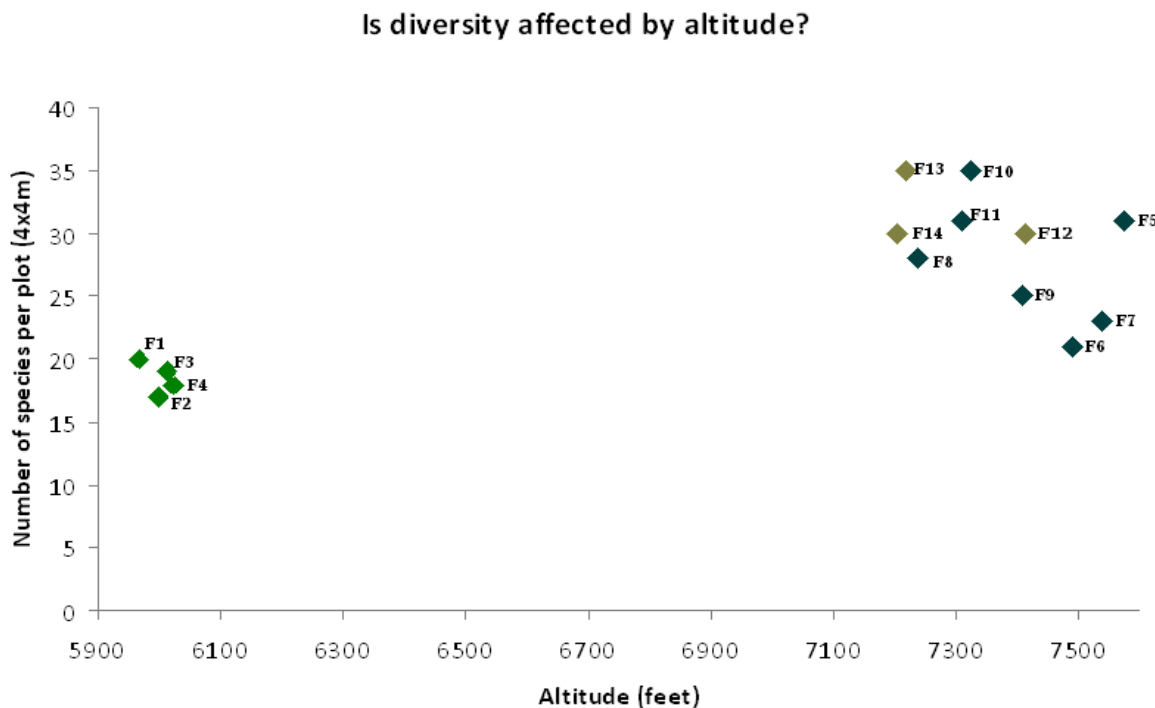


Table 2 Invertebrates found from surveys within or adjacent to forests

Invertebrates	F1		F2		F3		F9		F10	
	Species	Number	Species	Number	Species	Number	Species	Number	Species	Number
Brachonid wasp	1	6	4	8						
Chrysomellidae beetles	1	2								
Cicadillidae (cicada family)	4	4	1	1	1	1	2	5		
Cixidae	1	1								
Cockroach			1	1						
Coreidae Bug	1	1								
Damselfly									1	1
Forest bee									1	1
Gnats							1	6	1	2
Ichneumonid Wasp					1	1			1	1
Lasicampid pupae					1	1				
Moth	1	1								
Praphonidae wasp							1	11		
Reduviidae bugs	1	4								
Stalk-eyed flies	2	24	2	7						
Trichopteryn fly					1	2				
Other flies	14	45	9		3	3	7	34	1	2
Totals	12	43	8	17	4	5	4	22	4	5

Table 3 Mammals found from surveys within or adjacent to forests

Common Name	Species Name	F1	F2	F3	F4	F6	F7	F9	F10	F11	F12	F13
Aardvark	<i>Orycteropus afer</i>							+	+	+		
African clawless otter	<i>Aonyx capensis</i>	+										
Blue monkey	<i>Cercopithecus albogularis</i>		+		+	+	+	+	+	+	+	+
Bushbuck	<i>Tragelaphus scriptus</i>	+	+	+	+		+		+		+	
Bushpig	<i>Potamochoerus larvatus</i>	+	+	+	+				+			+
Lesser cane rat	<i>Thryonomys gregorianus</i>		+									
Common duiker	<i>Sylvicapra grimmia</i>	+		+	+			+	+		+	
Eland	<i>Taurotragus oryx</i>								+			
Elephant	<i>Loxodonta africana</i>	+	+	+	+							
Leopard	<i>Panthera pardus</i>										+	
Mongoose	Herpestidae (family)							+		+		+
Porcupine	<i>Hystrix africaeaustralis</i>	+		+		+	+	+	+	+		
Red forest duiker	<i>Cephalophus natalensis</i>					+	+					+
Reedbuck	<i>Redunca arundinum</i>					+						
Roan antelope	<i>Hippotragus equinus</i>			+								
Yellow Baboon	<i>Papio cynocephalus</i>		+	+	+							
Total no. of species		6	6	7	6	4	4	5	7	4	4	4

Table 4 Birds found from surveys within or adjacent to forests

Common Name	Species Name	F1	F2	F3	F4	F5	F9	F10	F11	F12	F13
African Yellow White-eye	<i>Zosterops senegalensis</i>			+							
Augur Buzzard	<i>Buteo augur</i>										+
Black-eyed Bulbul	<i>Pycnonotus barbatus</i>	+	+				+				
Black-headed Oriole	<i>Oriolus larvatus</i>			+							
Bleating Warbler	<i>Camaroptera brachyura</i>					+	+				
Blue Swallow	<i>Hirundo atrocaerulea</i>									+	
Brown snake eagle	<i>Circaetus cinereus</i>										+
Cape Batis	<i>Batis capensis</i>		+				+	+			
Crowned Hornbill	<i>Tockus alboterminatus</i>			+							
Eastern Double-collared Sunbird	<i>Nectarinia mediocris</i>							+			
Fantail Flycatcher	<i>Myioparus plumbeus</i>		+								
Greater Striped Swallow	<i>Hirundo cucullata</i>									+	
Long-crested Eagle	<i>Lophaetus occipitalis</i>										+
Mountain Nightjar	<i>Caprimulgus poliocephalus</i>									+	
Olive Breasted Mountain Bulbul	<i>Andropadus tephrolaemus</i>					+	+				
Purple-crested Turaco	<i>Tauraco porphyreolophus</i>	+				+		+			+
Rameron Pigeon	<i>Columba arquatrix</i>										+
Red Tufted Malachite Sunbird	<i>Nectarinia johnstoni</i>					+		+			
Shelley's Francolin	<i>Scleroptila shelleyi</i>		+								
Slender billed R-w Starling	<i>Onychognathus tenuirostris</i>								+		
Starred Robin	<i>Pogonocichla stellata</i>							+			
White-tailed flycatcher	<i>Trochocercus albonotatus</i>										+
Woodland Kingfisher	<i>Halcyon senegalensis</i>			+							
Yellow bellied sunbird	<i>Nectarinia venusta</i>	+									
Yellow Warbler	<i>Chloropeta natalensis</i>				+						
Total Number of Species		4	4	4	1	4	4	6	1	3	6



Above: The area around Forests 5-8 in the Juniper Forest area, the individual forest patches are tucked away, following river gullies in the landscape. Those in this particular area are connected by *Protea spp.* scrub; possibly an indication that they were once connected.

Above right: Inside a cavity created by a large strangler fig, the tree it once encapsulated has long since rotted away.

Above left: The canopy of Forest 6, at the top, in the foreground is a branch covered in small brown epiphytic ferns, found in almost every forest.

DISCUSSION

The forests from Kasaramba and Juniper were at a similar altitude ranging from 7200ft to 7500ft, whilst Chisanga's forests were lower at around 6000ft (5966-6023ft).

The plots taken from Juniper and Kasaramba forests showed no significant difference from each other in either density or diversity. By comparison Chisanga showed visibly lower diversity of species and tree density. However using a one-way analysis of variance (ANOVA) test for comparison of the three unmatched groups from the 3 areas of forest, it was found that the difference were not statistically significant. ($F=1.08$ with 2/11 degrees of freedom at .05 confidence limit). One possible reason for this could be that there was a considerable difference between the forests, even in one area. For example Forest 5 had a very high number of trees compared with others from the same area (see Figure 4).

The diversity of the forests (figure 5) was then compared using another one-way ANOVA test where it was found to be statistically different ($F=4.32$ with 2/11 degrees of freedom at .05 confidence limit). (Cann, 2006)

One big difference between the Chisanga forest area and the other two is that the former is on the western side of the escarpment, the others, are on the eastern part of the park and exposed to the rains as they come off Lake Malawi. Dowsett-Lemaire (1985) obtained rainfall data from 21 different weather stations on and near the Nyika Plateau; Kasaramba was shown as having the highest annual rainfall of all 21 areas at an average of 1687mm. This higher rainfall enabled more epiphytic plants and richer undergrowth. At Chisanga the nearest weather station was below the falls at Kaparekezi and was 1588mm p.a. on average, not much lower than Kasaramba. However outside of the riverine areas, the surrounding vegetation was quite dry, with mainly *Brachystegia* woodland, an indicator of a primarily dry area. Much of the high plateau over 7000ft was found to experience relatively low rainfall of 1000-1200mm per annum (Dowsett-Lemaire, 1985).

Diameter of Trees (DBH)

Chisanga had few tall trees, as seen in Figure 1, only Forest 3 had any over 40cm, but Chisanga had the most trees in the 11-30cm range. Forest 1 was very wet and had a good spread of diameters indicating a forest that is developing well. It was quite dark with little undergrowth, restricted by the dense canopy of *Syzigium cordatum*. Forest 2 had the largest number of trees at 11-20cm and along with Forest 1, it also had the greatest density for 21-30cm and had the greatest density of trees overall in Chisanga. Forest 3 had no saplings under 11cms, which indicates a mature forest.

Juniper had the largest density of trees and the largest range of tree diameters up to the biggest tree of all at a diameter of 82cm (Figure 2). There are trees in almost all size categories, indicating mature but developing forests. Five out of six forests have trees over 40cms in diameter. Forest 5 had a very large number of young trees, suggesting secondary growth. This is the one that has exceptionally high density in Figure 5. This is either a new forest forming or one regenerating after damage by fire and poachers removing the largest trees. There is no way to be certain which is the cause, but numerous signs of poaching were found in this forest and others nearby.

Kasaramba had relatively few large trees, only two and both in Forest 12. All other trees were under 30cm in diameter (Figure 3). The steepness of the slope, landslips and lack of soil could discourage growth of large trees, but forest 12 had maintained one very large tree. Our sampling was at the higher end of these enormous rainforests and larger trees could be found in the folds of the slopes lower down. The very largest trees may well be less of a target for poachers, who would find the trees of diameters of 30cm-40cm easier to handle. The poached trees we did see at Kasaramba were around 30cm diameter.

Plant Species

The Forest Fever Tree, *Anthocleista grandiflora* grows to 35m tall and was previously only recorded below Chisanga falls, (below 1800m); was found in Forest 1 outside of the plots, it was easily the biggest tree in the forest at 140cm at breast height. The biggest tree with a single trunk was a *Polyscias fulva*, common name: parasol tree, a fast growing pioneer species found at most of the forest sites, except Chisanga; this individual in Forest 8 measured 256cm at breast height. However the biggest single-individual by far was a *Syzygium cordatum*, which at breast height had broken into

four trunks of 236, 211, 200 and 72cm! Known commonly as waterberry; an evergreen tree with a rounded crown and edible shiny purple-black berries. *A. grandiflora* and *P. fulva* were recorded here for the first time by Biosearch.

In the final forest at Kasaramba, there was a possible sighting of *Impatiens rubromaculata*, an endemic subspecies to the Nyika Plateau. In the same forest *Psydrax livida*, a small tree up to 8m, has previously only been found up to 5200ft, whereas the five individuals recorded in Forest 14 were over 2000ft above this.

The tree fern *Cyathea manniana* has only previously been recorded at the eastern foot of Nganda. However, it was found locally common in forest 10 near Juniper and most commonly at Kasaramba in the very wet forests of 12 and 14. The trees were within the normal habitat of evergreen mist forests at altitudes of 5000- 7500ft. (Burrows & Willis (Eds), 2005

Invertebrates

Table 2 shows the invertebrates collected via the sweep-netting method, the “species” column refers to the number of species collected, whilst the “number” columns show the numbers of individuals. The average number of species per forest was very high in all forests. However more invertebrate species by far were found at the lower altitude in Chisanga. More individuals were captured in the wetter Forest 1 than any of the other forests, Forest 9 in the Juniper Forest area contained the next-higher number of individuals however this was only half as much as Forest 1.

Mammals

The most widespread species to appear in the mammal surveys were the Blue Monkey, Bushbuck and Porcupine. Common Duiker and Bushpig were also found in just over half the forests surveyed. The remains of a poached Blue monkey were found in Forest 12 at Kasaramba. Kasaramba had the fewest number of species per forest. This coincides with the greatest number of poaching snares.



Juniper had a mixed number of species whilst Chisanga had consistently higher numbers or species in all four forests, Evidence of Bushpig, Bushbuck and Elephant were found in all four forests at Chisanga.

The photo on the left is a Roan antelope (picture by Tim Wayman); in the background is a patch of forest. Most evidence of the larger mammals was found outside and on the edges of forests implying that the forest patches provide important shelter to animals typically associated with grassland.

Birds

All forests surveyed held fairly consistent numbers of species (see table 4), aside from Forests 4 and 11 in which only 1 species was found. Twenty-five species of birds were identified across the forests, between 1 and 6 species were seen per forest. Many species were found only once, the Purple Crested Turaco was the most widespread, found in four forests and the Black-eyed Bulbul and the Cape Batis were the next widespread, being found in 3 out of 10 forests. A number of species recorded in the forests had not been recorded in the 2008 Biosearch expedition; these are highlighted in Table 4.

Replanting of Chilinda

Recently the parks department has begun the process of re-planting the forest around Chilinda camp with native species. It was requested that this project provide recommendations to the species that could be used. Chilinda is at a height of around 7500ft, this corresponds with the forest patches Forests 5-14; however the terrain in the areas around Kasaramba (Forests 12-13) is very different (i.e. wetter) than that at Chilinda, which may be more comparable with the terrain around Juniper. One of the common species of tree in the juniper area is *Hygenia abyssinica*, seen on the right on the outskirts of Forest 8; this species was frequently encountered at the forest edges. No single tree species was uniformly dominant in any of the forests, some species were found in one forest patch but not another, (the complete list of all plant species recorded, and in which forest they were found is located in the appendix.) therefore all this report can do is highlight some of the major trees. These include *Hygenia abyssinica*, *Maesa lanceolata*, *Diospyros whyteana*, *Rapanea melanophloes*, *Podocarpus sp.* and *Polyscias fulva*. These trees were found both on the outskirts and within forests, making them ideal to begin planting with, although some trials might be conducted to find what grows best and where.



Hygenia abyssinica, pioneer at forest edge

The pine trees already growing at Chilinda are very hardy, native species may not grow as well in the exposed plateau. Much of the pine is exposed to winds which may slow or prevent the growth of species typically found at the heart of a forest. Therefore it may be advisable to leave some of the existing pine forest around the outskirts to provide shelter for newly growing native species.

The image on the left is that of Forest 5 and shows that it is growing just off the peak of the hill, and is not exposed in the same way as the artificially planted forest at Chilinda; the trees would grow better if planted in the lower, sheltered areas in the camp.



Forest patch near Juniper

Kit Clayton



Top Left: The terrain at Kasaramba, the forests are mainly located along steep-sided gullies, Forest 14 is located within the folds on the centre-right of the photo.

Top right: The undergrowth varied from forest to forest, here (forest 12) it was tall and close, but others were spread further apart or barely a foot in height.

Centre left: Chisanga area, Steven identifying a species within a plot marked by the tape measure. sometimes identification was not as easy and often involved climbing on his part!



Bottom left: Patches of evergreen forest: this is how they typically appear in most parts of the Nyika landscape

Photos by *Tim Wayman*.

CONCLUSIONS

Every forest surveyed was different from the next. There were more significant changes between altitudes of 6000 and 7500ft as would be expected, but forest patches in the same area, even those only a short distance from each other, contained a number of different species. This highlights the need to prevent the burning of these forest patches as each one provided different habitats. Of major concern is the sheer numbers of poacher's snares found in some of the forests around Juniper and Kasaramba, particularly with the consistency of signs of the rare blue monkey in most of the forest patches. Scouts patrolling these areas would be advised to do a sweep of all the forests where possible.

Not all species could have been identified in all forest patches; most forests were surveyed fairly comprehensively, and all of the dominant tree and under story species were identified in each forest; however it is likely that a few species remained elusive in the larger forests.

There is always more that can be done, more data collected, yet the best results were obtained within the time available. Had this project more time and more people available then the group could have split in two; with one group pacing around the outside of the forest, recording its size and edge-plants, whilst the other swept the inside, recording interior species and doing 4x4m plots.

Finally, an idea for a project at a later date would be to find and photograph as many tree species as can be found, and compose a key that could be taken into the field and used on later expeditions.

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Appendix 1 Plant Species List: 3 pages

See Table 1 for details on each forest patch F1 to F14

Species Name	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13	F14
<i>Acalypha</i> sp.	+		+											
<i>Adiantum</i> sp.					+					+		+	+	+
<i>Aeschynomene</i> sp.														+
<i>Aframomum angustifolia</i>			+											
<i>Agarista salisfolia</i>								+		+				+
<i>Allophylus africana</i>						+			+					
<i>Anisopappus chinensis</i>												+		+
<i>Anthocleista grandiflora</i>	+													
<i>Aphloea diformis</i>										+	+		+	+
<i>Aphloia theiformis</i>						+	+							
<i>Artemisia afra</i>					+			+	+	+	+			
<i>Asparagus</i> sp.					+		+	+	+		+			+
<i>Berberis holstii</i>					+									
<i>Berneia</i> sp.					+									
<i>Bidens</i> sp.					+								+	
<i>Brideria micrantha</i>	+	+	+											
<i>Brillantaisia</i> sp.									+		+			
<i>Buddleja salvifolia</i>			+	+										+
<i>Carex</i> sp.						+		+						
Celastraceae (family)							+		+					
<i>Celtis africana</i>						+				+		+	+	+
<i>Clausena anisata</i>					+		+			+				
<i>Clematopsis scabiosifolia</i>						+			+		+			
<i>Clutia brassii</i>													+	
<i>Clutia conferta</i>								+						
<i>Clutia drassii</i>										+				
<i>Coffea logustroides</i>								+						
<i>Conyza limosa</i>	+													
<i>Crotalaria</i> sp.										+				
<i>Cussonia spicata</i>						+	+	+	+	+		+		
<i>Cyathea manniana</i>										+		+		+
<i>Cyperua alternifolius</i>	+	+		+	+	+	+	+	+	+	+	+	+	+
<i>Desmodium</i> sp.	+	+	+	+				+						
<i>Diospyros whyteana</i>		+			+	+	+	+	+	+	+	+	+	
<i>Dissotis princeps</i>	+	+	+	+	+								+	
<i>Dodonea viscosa</i>									+					
<i>Dombeya burgessiae</i>	+		+	+										
<i>Dombeya torrida</i>						+	+		+	+	+	+		+
<i>Dracaena laxissima</i>							+		+	+				
<i>Dracaena reflexa</i>												+	+	+
<i>Entandrophragma exelsum</i>						+								
<i>Erica benguelensis</i>					+		+				+		+	+

Appendix 1 Page 2														
Species Name	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13	F14
Eriosema sp.					+		+							
Euphorbia sp.								+						
Faurea rochetiana				+										
Fern Athyrium shimperi	+		+	+		+	+	+						
Ficus sp.	+							+	+					
Filicium dispiens						+			+	+		+		
Galium bussei													+	
Garcinia kingaensis						+	+	+						
Garcinia sp.								+			+			
Geranium vagans												+		
Ginidia fastigata														+
Gnidia sp.					+			+	+			+		
Grewia sp.			+											
Hagenia abyssinica					+	+		+		+	+	+	+	+
Helichrysum sp.					+				+					
Heteromorpha trifoliata												+		+
Hibiscus sp.		+												
Hypericum revolutum													+	
Hyperrhenia sp.									+	+				
Hypoestes sp. (2)			+			+	+	+	+	+	+			
Ilex mitis													+	
Impatiens sp.														+
Issoglosa sp.										+		+	+	
Juniperus procera										+				
Kiggelaria africana												+		
Kniphofia sp.					+									
Kotschya sp.														+
Landolphia buchananii			+	+										
Lobelia sp.	+	+											+	
Macaranga capensis													+	
Maesa lanceolata	+	+	+		+	+		+	+	+	+	+	+	+
Maytenus acuminata							+							
Maytenus heterophylla					+			+			+			
Ekebergia capensis											+			
Myrica humulis								+		+	+	+	+	
Nuxia congesta							+	+	+		+			
Olea sp.				+										
Oxyanthus sp.												+		
Panicum sp.				+	+		+						+	
Pentas sp.												+	+	
Phragmites mauritianus	+	+	+											
Pimpinella sp.					+									
Pipper capensis	+	+	+	+										+
Pittosporum viridiflorum									+					

Appendix 1 Page 3														
Species Name	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13	F14
Plectranthus sp.					+							+	+	+
Setaria incrassata										+	+		+	
Podocarpus sp.						+	+	+	+	+	+	+		+
Polygala sp.														+
Polyscias fulva						+	+	+		+	+		+	
Protea angolensis							+							+
Psychotria peduncularis	+	+	+	+				+	+	+	+	+	+	+
Psydrax livida														+
Pteridium aquilinum					+	+	+		+	+	+		+	+
Pycnostachys sp.			+	+							+		+	
Rapanea melanophloes					+	+	+		+	+	+	+	+	+
Rauvolfia caffira		+		+										
Rawsonia lucida												+	+	+
Rhamnus prenoides						+				+				
Rhus natalensis		+												
Rhus sp.					+		+			+	+			
Rothmania sp.													+	
Pentas schimperiana		+			+	+	+							
Rubus apetalus	+	+	+	+		+						+		
Rutidea fuscescens				+										
Rytiginia sp.												+	+	
Satureja sp.					+									
Schefflera sp.												+	+	
Setaria grandis										+		+		
Sida acuta	+													
Smilax kraussiana	+	+	+	+										
Senecio sp.					+						+			
Solanum aculeatissimum								+						
Stephania abyssinica	+				+				+	+	+			
Streblochaete longiarista					+	+					+			
Syzygium cordatum	+	+	+	+				+						
Tecomaria nyassae													+	
Tephrosia whyteana					+									
Themeda triandra										+	+			
Toddalia asiatica								+		+	+	+	+	
Triumfetta rhomboidea													+	
Schefflera abyssinica					+									
Xymalos monospora														+
Zanthoxylum chalybeum										+				
Total species per forest:	20	17	19	18	31	21	23	28	25	35	31	30	35	30

PLANT COLLECTIONS

Steven Mphamba

Table 1 Plant species and Seeds collected for Millenium Seeds Bank (MSB) and for the National Herbarium of Malawi (SM)

MSB NO	SM No.	Genus and species	Family	Location	Collected
MSB 944	SM 101	<i>Hippocratea africana</i>	Hippocrateaceae	South Rukuru Bridge - Rumphi	27/07/2009
MSB 945	SM 102	<i>Turbina stenosiphon</i>	Convolvulaceae	South Rukuru Bridge - Rumphi	27/07/2009
MSB 946	SM 103	<i>Pentas decora</i>	Rubiaceae	Chovuro Forest - Nyika Plateau	28/07/2009
MSB 947	SM 104	<i>Crotalaria pilosiflora</i>	Papilionoideaea	Chovuro Forest - Nyika Plateau	28/07/2009
MSB 948	SM 105	<i>Chamecrista parva</i>	Papilionoideaea	Chovuro Forest - Nyika Plateau	28/07/2009
MSB 949	SM 106	<i>Pycnostachys urticifolia</i>	Lamiaceae	Chovuro Forest - Nyika Plateau	28/07/2009
MSB 950	SM 108	<i>Stomatanthus africana</i>	Asteraceae	Vitinthiza peak - Nyika plateau	29/07/2009
MSB 951	SM 107	<i>Leonotis myricifolia</i>	Lamiaceae	Lusero river bank - Nyika plateau	28/07/2009
MSB 952	SM 109	<i>Moraea macrantha</i>	Iridaceae	Vitinthiza area - Nyika plateau	28/07/2009
MSB 953	SM 110	<i>Panicum phragmitoides</i>	Poaceae	Runyina river bank - Nyika	30/07/2009
MSB 954	SM 111	<i>Streblochaete longiarista</i>	Poaceae	Runyina river bank - Nyika	30/07/2009
MSB 955	SM 112	<i>Kosteletzkya adoensis</i>	Malvaceae	Runyina river bank - Nyika	30/07/2009
MSB 956	SM 113	<i>Rumex bequaertii</i>	Polygonaceae	Luselo river bank - Nyika plateau	30/07/2009
MSB 957	SM 114	<i>Vernonia wollastonii</i>	Asteraceae	Luselo river bank - Nyika plateau	30/07/2009
MSB 958	SM 115	<i>Lantana rhodesciensis</i>	Verbenaceae	Base of Vitinthiza peak - Nyika	30/07/2009
MSB 959	SM 116	<i>Tragia brevipes</i>	Euphorbiaceae	Zovo chipolo forest - Nyika	31/07/2009
MSB 960	SM 117	<i>Ammania prieuriana</i>	Lythraceae	Chisanga falls area - Nyika	08/01/2009
MSB 961	SM 118	<i>Agelanthus fuellebornii</i>	Loranthaceae	Chisanga falls area - Nyika	08/01/2009
MSB 962	SM 119	<i>Peddiea africana</i>	Thymeliaceae	Chisanga falls area - Nyika	08/01/2009
MSB 963	SM 120	<i>Arthraxon micans</i>	Poaceae	Chisanga falls - Nyika	08/01/2009
MSB 964	SM 121	<i>Trichopteryx fruticulosa</i>	Poaceae	Chisanga falls - Nyika	08/02/2009
MSB 965	SM 122	<i>Bidens acuticaulis</i>	Asteraceae	Chisanga falls - Nyika	08/02/2009
MSB 966	SM 123	<i>Indigofera microcalyx</i>	Papilionoideaea	Path to Chisanga falls - Nyika	08/03/2009
MSB 967	SM 124	<i>Aristida junciformis</i>	Poaceae	Chisanga falls sign post - nyika	08/03/2009
MSB 968	SM 127	<i>Kniphofia grantii</i>	Asphodelaceae	Juniper forest - Nyika plateau	08/05/2009
	SM 125	<i>Prunus africana</i>	Rosaceae	Juniper forest - Nyika plateau	08/05/2009
	SM 126	<i>Mystroxydon aethiopicum</i>	Celastraceae	Juniper forest - Nyika plateau	08/05/2009
MSB 971	SM 128	<i>Crotalaria bequaertii</i>	Papilionoideaea	Futi hills - Juniper area - Nyika	08/06/2009
	SM 129	<i>Peperomia tetraphylla</i>	Piperaceae	Futi hills - Juniper area - Nyika	08/06/2009
MSB 969		<i>Selago thomsonii</i>	Schrophulariaceae	kasaramba - Nyika plateau	08/07/2009
MSB 970		<i>Sebaea leiostyla</i>	Gentianaceae	kasaramba - Nyika plateau	08/07/2009





Hibiscus rhodanthus



Impatiens rubromaculata shulziana - endemic



Peddiea africana



Thunbergia alata



Lobelia sp



Eriocaulon sp.



Crotalaria sp



Syzygium cordatum



Brachystegia spiciformis



Hippocratea africana



Plectranthus esculentus



Blepharis grandis
and *Ipomoea sp.*





Helichrysum sp.



Dissotis princeps.



Orchid, Disa baurii



Delphinium dasycaulon



Crassula.









ENTOMOLOGY

R.J.Murphy F.R.E.S.

SUMMARY

It was bitterly cold at night on the high plateau with the temperature falling below freezing and a strong wind chill factor, so that checking the lights more than once was not even considered. This was the first time in my life that I went to bed in jersey, jacket and kept my boots on! Yet despite the conditions and strong winds, small numbers of moths were coming to the lights, including some very interesting species that are probably new to science. The Juniper Forest was a little more sheltered at night and we caught some of the delicate 'Plume moths', with wings like splayed feathers. It is thought that several of these will be new to science and have been sent to Russia for study by the specialist.

Day temperatures were much more bearable but there was little flying at this dry time of year, though I was surprised to see the large and very rare Cetoniid beetle *Ceratorhina preissi* buzzing about out of reach of the net in the Juniper Forest. We also found near the stream there the endemic Cetoniid *Melinsthes jocquei*.

Bushes and small trees of many different species on the high plateau were covered with the red and black caterpillars of the endemic yellow Saturniid moth *Ubaena dolabella*. There should be an explosion of these large day flying moths in January or February. The other capture of note was in a swampy area of the plateau. It was the Lycaenid butterfly *Harpenderyeus hazelae*, only previously known from the Misuku Hills in the North of Malawi.

Mr Kaunda found a second specimen of a small cicada which is new to science but we need more of them in order to name this new species which is likely to hatch in numbers in September or October. Their high-pitched calls are now beyond my hearing range and I need younger people to find them for me. Although the catch was small, it was of considerable scientific interest and an insight into what can be found on Nyika at this cold time of year.

Vwaza Marsh was very dry with unexpectedly strong winds, which led us to take the lamps down at night for fear they would be smashed to pieces. Our visit was all too brief and did not yield many specimens. The list that I have compiled below is from previous visits. There are many species still awaiting determination from this most interesting reserve where further collecting in the rainy season should produce a wealth of new material.

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Giant stick insect at the north gate of Vwaza Sanctuary

Marianne Overton

UPDATED LIST OF IDENTIFIED INSECTS FOUND IN NYIKA NATIONAL PARK AS AT 12TH FEBRUARY 2010

The arrangement below of main families is in systematic order but sub families, genera and species are in alphabetical order for ease of reference.

Odonata (Dragonflies)

Zygoptera (Damsel flies)

Agridae

Phaon iridipennis (Burmeister 1839)

Chlorocyphidae

Chlorocypha consueta (Karsch 1899)

Platycypha caligata caligata (Selys 1853)

Chlorolestidae

Chlorolestes conspicua Selys

Coenagriidae

Aciagrion gracile (Sjostedt 1909)

Enallagma subfurcatum Selys 1876

Pseudagrion spernatum spernatum Selys 1881

Lestidae

Lestes pallidus Rambur 1842

Protoneuridae

Chlorocnemis marshalli marshalli Ris 1921

Chlorocnemis montana maccleeryi Pinhey 1961

Anisoptera (Open winged dragonflies)

Aeshnidae

Aeshna ellioti usambarica Forster 1906

Anax imperator mauricianus Rambur 1842

Anax separatus Hagen 1867

Hemianax ephipigger (Burmeister 1839)

Gomphidae

Notogomphus zernyi (St Quentin 1942)

Paragomphus cognatus (Rambur 1842)

Libellulidae

Atoconeura biordinata Karsch 1899

Crocothemis sanquinolenta (Burmeister 1839)

Orthetrum caffrum caffrum (Burmeister 183)

Orthetrum julia Kirby 1900

Orthetrum julia falsum Longfield 1955

Palpopleura jacunda Rambur [1842]

Palpopleura lucia (Drury 1773)

Pantala flavescens Fabricius 1798

Porpax risi Pinhey 1958

Tramea basilaris Palisot de Beauvios 1817

Trimethis annulata (Beauvois 1805)

Trimethis arteriorosa (Burmeister 1839)

Trimethis furva Karsh 1899

Trimethis wernerii Ris 1912

Blattodea (Cockroaches)

Derocalymna versicolor Burmeister

Pseudopeltis neavei Princes 1963

Isoptera (Termites)

Separate report by Dr Sarah Donovan

Mantodea (Praying Mantises)

Mantidae

Metentella mervensis Sj

Rhomboderella scutata (Bolivar 1889)

Tarachodes sanctus (Saussure 1871)

Dermaptera (Earwigs)

All specimens awaiting determination

Orthoptera (Grasshoppers)

Encifera (Crickets)

Tettigoniidae

Clonia Wahlbergi Stal

Conocephalus maculatus (Le Guillou)

Enyaliopsis petersi Schaum

Enyaliopsis viphya Glenn

Phaneroptera sparsa Stal

Ruspolia vicinus Walker

Tylopsis bilineolata (Serville)

Tylopsis continua (Walker)

Zabalius orientalis Karsch

Caelifera (Grasshoppers)

Acrididae

Abisares viridipennis (Burmeister 1838)

Acanthacris ruficornis (Fabricius 1787)

Acorypha laticosta (Karsch 1896)

Acrida acuminata Stal 1873

Acrophymus sqamipennis (Brancsik 1897)

Acrotylus patruellis (Herrich-Schaffer)

Anthermus ebneri Ramme 1929

Anthermus granosus (Stal 1828)

Brophyta tectifera (Karsch 1897)

Cannula greacilis (Burmeister 1838)

Cardeniopsis chloronotus (Bolivar 1912)

Catantops axillaries (Thunberg 1815)

Catantops Melanostictus (Schaum 1853)

Cannula gracilis (Burmeister 1838)

Coryphosima stenoptera (Schaum 1853)

Cyrtacanthacris septemfasciata (Serville 1838)

Faureia milanjica (Karsch 1896)
Gastrimargus acutangulus (Stal 1873)
Gastromargus africanus (Saussure 1888)
Gymnobothrus linea-alba I Bolivar 1889
Heteropternis coulöniana (Saussure 1884)
Leptacris monteiroi monteiroi (I.Bolivar 1890)
Machaeeridia bilineata Stal 1873
Morphacris fasciata (Thunberg 1815)
Ornithacris cyanea (Stoll 1813)
Orthochtha dasycnemis (Gerstaecker 1869)
Poecilocerastis tricolor (I.Bolivar 1912)
Pseudoarcpytera cephalica (I.Bolivar 1914)
Rhytidacris tectifera (Karsch 1896)
Scintharista notobilis (Walker 1870)
Tmetonota abrupta (Walker 1870)
Tylotropidus gracilipes Brancsik 1895

Lentulidae

Usambillia olivacea Sjostedt 1909

Pamphagidae

Lobosceliana gilgilensis I Bolivar 1915

Pyrgomorphae

Maura bolivari Kirby 1902
Phymateus viridipes Stal 1873
Phyteumas purpurascens (Karsch 1869)

Phasmatodea (Stick insects)

All specimens awaiting determination

HEMIPTERA

Heteroptera (Stink bugs / Assassin bugs)

Belastomatidae

Lethocerus niloticus Stal

Coreidae

Anoplocnemis curvipes Fabricius
Anoplocnemis dallasiana L & S
Anoplocnemis montandorii Distant
Mirperus tongorma
Petascelis remipes Signoret

Lygaeidae

Lygaeus lemniscatus Stal
Spilostethus rivularis Germar

Pentatomidae

Agonoscelis pubescens Thunberg
Antestiopsis cincticollis Schaum
Atelocera attenuata Distant
Atelocera foveata Dallas
Dalsira atricostata Distant
Dismegistus royeri Jeanneli
Dysdercus fasciata Signoret
Encosternum delegorguei Scopoli
Natalicola delegorguei Spin
Nazara viridula Fabricius

Reduviidae

Coranopsis vittata Horvath
Ectomocoris cruciger Fabricius
Etrichodia crux (Thunberg)
Rhinocoris albopunctatus Stal
Rhinocoris erythrocnemis Germar
Rhinocoris neavei Bergoth 1912
Vitumnus scenicus Stal

Rhopalidae

Serinetha amicta Germar

Scutelleridae

Callidea drgii Germar
Deroplax silphoides Thunberg

Homoptera (Plant bugs)

Cicadidae

Ioba leopardina Distant
Koma bombifrons Karsch
Monomatapa insignis Distant
Orapa nyassana
Ugada nutti Distant

Circopidae

Ptyelus flavescens Fabricius
Ptyelus grossus Fabricius
Locris jugalis Jacobi
Locris incarnata Walker

Coccidae

Gascardia brevicauda (Hall)
Saissetia oleae (Bernard)

Eubrybrachidae

Mesonitys fueleborni
Paropioxys bellus Distant

Fulgoridae

Benamatapa marshalli Distant
Zanna claviceps (Karsch 1890)
Zanna pustulosa Gerstaecker
Zanna tenebrosa Fabricius

Neuroptera (Ant Lions)

Acalaphidae

Tmesibasis lacerata (Hagen)

Mantispidae

Mantispa tenella Erichson

Myrmeliontidae

Banyutus idoneus (Banks 1911)
Banyutus lethalis (Walker 1853)
Centroclisis brachygaster (Rambur 1842)
Distoleon posterior (Navas 1913)
Myrmeleon lethifer Walker 1853
Palpares normalis Navas 1911

Palpares obsoletus Gerstaecker 1888
Palpares sparsus (McLachlan 1867)

Psychopsidae

Silveria marshalli McLachlan

Coleoptera (Beetles)

Adephaga (Predatory Beetles)

Carabidae

Callistomimus rufiventris Brett
Cypholoba graphipteroides Guerin
Cypholoba tenuicollis Horni
Eccoptoptera cupricollis Chandois
Galeritiola inversa Basileusky
Psecadius obertheuri Gestro
Scarites senegalensis Dejean
Sterestoma stuhlmanni Kolbe

Cicindelidae (Tiger Beetles)

Cylindera marshallisculpta (W Horn 1913)
Dromica gracillis W Horn 1909
Elliptica laticornis disperseflavescens (Horn 1913)
Foveodromica laterodeclevis (W.Horn 1929)
Foveodromica nicolae Monfort & Weisner 2007

Lophyra saraliensis saraliensis (Guerin-Meneville 1849)
Prothymidia angusticollis angusticollis (Boheman 1848)
Pseudodromica marshalli Peringuey 1894
Rhopaloteres grandis interruptoabbreviatus (W Horn 1921)
Trichodela diversilabris Cassola 1995

Dytiscidae (Water Beetles)

Hydaticus flavolineatus Boheman

Polyphaga (Leaf eating & other Beetles)

Anthribidae (Fungus Beetles)

Xylinada meculipes Fahraeus

Buprestidae (Jewel Beetles)

Acmeodera subprasina Mars
Alissoderus nodicollis
Hoplistura disjuncta Fabricius
Meliboeus carinatus
Psiloptera albomarginata Herbst
Psiloptera coleopteroides Sol
Psiloptera iridiventris Kerremans
Spenoptera longiusula
Sterapsis amplipennis Fahraeus
Sternocera orissa variabilis Kerremans 1886

Cantharidae

Lycus murrayi Bourgoin

Cerambycidae (Longhorn Beetles)

Aulocopus natalensis White 1853
Calanthemis cf conradti Kolbe
Ceroplesis hauser conjunctai Hintz
Ceroplesis thunbergi Fahraeus
Chromolizus leucorhaphis (Gerstaecker 1855)
Coptoeme krantzi (Distant 1898)
Deroplia simplex (Fairmaire)
Dirphya leucostigma (Harold)
Erioderus pallens
Eunidia piperita Gahan
Eurysops insignis Aurivillius 1910
Hecyra obscurator Fabricius
Hecyra tenebrionides Fahraeus
Idactus strandi Breuning
Laziopezus nigromaculatus (Quedenfeldt)
Macrotoma natala Thomson 1860
Mimophrisma livingstonei Sudre & Teocchi 2001

Monoxenus bicarinatus Aurivillius
Noserius aenescens Aurivillius
Oligosmerus limbalis Harold
Phantasis avernica Thomson
Phyllocnema mirifica (Parc)
Prosopocera luteomarmorata Breuning
Prosopocera marshalli Aurivillius
Prosopocera schultzei Kratz
Purpuricenus laetus Thomson 1864
Stromatium barbatum Fabricius
Tragocephala ducalis White
Tragocephala frenata Gerst
Tragocephala variegata Bertoloni 1849
Xystrocera skeletoides Breuning 1957
Zoographus lineatus (Quedenfeldt 1882)

Chrysomelidae (Leaf beetles)

Asbecesta duviviari Jacobi
Bradlema neavei Heinze
Cassida suspiciosa Weise
Chrysomela saegeri Burgeon 1941
Corynodes dejeani Bertoloni
Gastrida abdominalis Chap
Hypercantha deverani Weise
Idacantha conifera Fairmaire
Phaedoria areata Fabricius

Cleridae (Checkered Beetles)

Dieroplesia 4 maculatus

Coccinellidae (Ladybirds)



Cheilomenes aurora (Gerstaecker 1781)
Cheilomenes lunata (Fabricius 1775)

Chnootriba similis (Thunberg 1781)
Declivitata olivieri (Gerstaecker 1862)
Epilachna ardiosiaca (Sicard 1912)
Epilachna dregei Mulsant 1850
Henospilachna bifasciata (Fabricius 1781)
Henospilachna quadrioculata (Kolbe 1897)
Lioadalia intermedia Crotch 1874

Curculionidae (Weevil Beetles)

Lixus areicatus

Elateridae (Click Beetles)

Anisomerus lamellicornis Fairmaire
Calais antinorii Candeze
Calais lecordieri Girard
Propsephus apiculatus Boheman
Propsephus nigrifrons Calais Basilevsky
Propsephus cf castaneus Fleutiaux

Erotylidae Fungus Beetles)

Plagiopisthen laevistriatus Arrow

Histeridae

Hister jeanelli Desbordes
Hister mechowi Schmidt
Kissister congoensis Burgeon
Tribalus floridus Vienna

Staphylinidae

Staphylinus subaenus Roth

Hispidae

Dactylispa pallipes (Kratz)

Hydrophilidae

Sphaeridium scarabaeoides Linnaeus

Lucanidae

Nigidius laticornis Boileau 1911

Meloidae



Coryna katonensis Pic
Coryna maivashana Pic
Coryna mylabroides Lap
Decatoma sobrina Peringuey

Mylabris amplectens Gerstaecker
Mylabris dincta Berbl
Mylabris holocericea Klug
Mylabris occidentalis Harold
Mylabris tripartita Gerstaecker
Mylabris tristigma Gerstaecker
Synhoria cephalotes Ol

Melyridae

Apalochrus malachioides Fairmaire
Ebaeus confluens
Melyris atricornis Champ
Melyris nigripes Hav

Passalidae

Didimus aloysiisabaudiae (Pangella 1906)

Scarabaeidae

Aphodiinae
Aphodius bucolicus Bordat
Aphodius cipriani Balthasar
Aphodius critchlowi Bordat
Aphodius gorillae Bordat
Aphodius humilis Roth
Aphodius kanemicus Endrodi
Aphodius kaszabi Endrodi
Aphodius koracsi
Aphodius lacunosus Schmidt
Aphodius leoninus Schmidt
Aphodius malawiensis Bordat
Aphodius noehaematiticus Landin
Aphodius Nyika Bordat
Aphodius pauliani Endrodi
Aphodius pseudourostigma Balthasar
Aphodius punctiger Endrodi
Aphodius rothschildi Schmidt
Aphodius schoutedeni Boucomont
Aphodius strangularis Bordat
Aphodius teter s.l. Roth
Lorditomaenus horni (Balthasar)
Notocaulus machatshkei Endrodi
Notocaulus schoutedeni Boucomont

Cetoniinae
Amauodes passerini nigricans Fairmaire 1897
Ceratorrhina preissi Moser 1912
Chondrorrhina picturata Harold 1878
Coelorrhina loricata loricata Janson 1877
Cosmiophaenia rubescens Brancsik 1914
Daedycorrhina bidenticornis Allard 1985
Diplognatha gagates Forster 1771
Eudicella euthalia oweni Allard 1985
Gnathocera cruda pilicollis Kolbe 1901
Gnathocera trivittata costata Ancy 1833
Heteropseudinca moseri Hauser 1904
Heteropseudinca wentzle heckmannae Kolbe 1901

Leucocellis adspersa (Fabricius 1801)
Leucocellis cupricollis Kratz 1880
Leucocellis diversiventris Moser 1913
Leucocellis rufiventris Moser 1913
Melenesthes jocquei Allard 1968

Pachnoda upangwana Moser 1918
Pachnodoides murphyi Alexis & Delpont 200
Plaesiorrhinella undulata Bates 1881
Poecilophila maculatissima Boheman 1860
Stethodesma strachani servillei White 1856
Stephanorrhina princeps Oberthur 1880
Tmesorrhina runsorica rubripes Allard 1991

Coprinae

Caccobius inconspicuous Fahraeus 1857
Caccobius ocellipennis D'Orbigny 1913
Catharsius mossambicanus Ferreira 1960
Catharsius satyrus Kolbe 1893
Copris amyntor Klug 1855
Copris dudleyi Cambefort
Copris insidiosus Peringuey 1900
Copris integer Reiche 1847
Copris mesacanthus Harold 1878
Diastellopalpus fuelleborni (Kolbe 1900)
Diastellopalpus thomsoni (Bates 1888)
Heliocopris hamifer Harold 1878
Heliocopris hermes Gillet
Onitis sulcipennis Felsche 1907
Onitis vanderkelleni Lansberge 1886
Onthophagus abruptus D'Orbigny 1913
Onthophagus albipodex D'Orbigny 1902
Onthophagus biconifor D'Orbigny 1905
Onthophagus cinctipennis Quedenfeldt 1884
Onthophagus clitellarius D'Orbigny 1908
Onthophagus cribripennis D'Orbigny 1902
Onthophagus crucenotatus D'Orbigny 1905
Onthophagus dinoderus D'Orbigny 1913
Onthophagus foraminosus D'Orbigny 1902
Onthophagus gradivus Balthasar 1966
Onthophagus granosus D'Orbigny 1913
Onthophagus insignis Peringuey 1896
Onthophagus laminidorsis D'Orbigny 1902
Onthophagus naevius D'Orbigny 1913
Onthophagus parumnotatus Fahraeus 1857
Onthophagus perniger Boucomont 1930
Onthophagus picatus d'Orbigny 1902
Onthophagus quadrimaculatus Raffray 1877
Onthophagus simulator D'Orbigny 1905
Onthophagus subhumeralis D'Orbigny 1902
Proagoderus biarmatus D'Orbigny 1908
Proagoderus brucei (Reiche 1847)
Proagoderus chrysopes (Bates 1888)
Proagoderus Dudley Cambefort 1980

Dynastinae

Cyphonistes vallatus (Wiedeman 1823)
Pycnoschema corpulenta Peringuey
Pycnoschema scrofa Harold 1880
Temnorrhynchus coronatus (Fabricius 1781)

Rutelinae

Popillia bipunctata (Fabricius)
Popillia browni Kolbe

Scarabaeinae

Anachalcos procerus Gerstaecker 1874
Garreta azureus Janssens
Garreta malleolus (Kolbe 1895)

Tenebrionidae

Asthenochirus plicatulus Fairmaire
Catamerus rugosus Gahan
Catamerus sulcatus Fabricius
Distretus variabilis Gib
Eupezus oppositus Hess
Lagria villosa Fabricius

Trogidae

Trox caffer liliana Scholtz
Trox nyansanus Haaf

Diptera (Flies)

Asilidae

Lamyra gulo Loew 1851
Laxenecera albicincta (Loew 1852)

Bombyliidae

Bombylius haemorrhoidalis Bezzi 1921
Exoprosopa magnipennis Bezzi 1924
Lithorhinia basalis Ricardo 1901

Eristalinae

Senapsis dibapha Walker 1849

Platystomatidae

Bromophila caffra Macqart 1846

Syrphidae

Senapsis dibapha Walker 1849

Tachnidae

Dejeania bombylans Fabricius 1798

Mecoptera (Hanging flies)

Bittacus livingstoni Londt 1981
Bittacus montanus Weeler
Bittacus tuxeni Byers

Trichoptera (Caddis Flies)

All species awaiting determination

Lepidoptera (Moths & Butterflies)



Heterocera (Moths)**Arctiidae**

Amerilia bubo (Walker 1855)
Anaphaasia cyanogramma Hampson 1903
Argina Amanda (Boisduval 1847)
Cyana pretoriae (Distant 1897)
Diacrisia lutescens (Walker 1855)
Diacrisia testacea (Walker 1855)
Eyrallpenus scioana (Oberthur 1880)
Galatra doriae (Oberthur 1879)
Macrosia chalybeata Hampson 1901
Nyctemera leuconoe leuconoe Hopffer 1858
Spilosoma lutescens Walker 1855
Seriartia metaxanthia Hampson 1909
Spilosoma sulphurea Bartel 1903
Teracotona metaxantha (Hampson 1909)
Tumicla sagenaria (Wallengren 1860)

Cossidae

Azygophleps aburae Plotz
Azygophleps coffea Aurivillius
Eulophonotus myrmelion Felder 1874
Macrocossus toluinus (Druce 1887)

Ctenuchidae

Syntomis cereera Linnaeus

Epilemidae

Leucoplema triumbrata (Warren 1902)

Eupterotidae

Jana plagiatus Bger

Geometridae

Ennominae

Aphilopota interpellans (Butler 1875)
Argyrophora confluens Kruger 1999
Argyrophora trofonia (Cramer [1779])
Argyrophora variabilis Kruger 1999
Ascotis reciprocaria (Walker 1860)
Chiasmia assimilis (Warren 1899)
Chiasmia brongusaria brongusaria (Walker 1860)

Chiasmia johnstoni (Butler 1894)
Chiasmia paucimacula Kruger 2001
Chiasmia procidata semispurcata (Walker [1863])
Chiasmia rectistriaria (Herrich-Schaffer 1854)
Chiasmia rhabdophora (Holland 1892)
Chiasmia semicolor (Warren 1899)
Chiasmia simplicilinea simplicilinea (Warren 1908)

Chiasmia steniata steniata (Guenee [1858])
Chiasmia trizonaria (Hampson 1909)
Cleora betularia (Warren 1897)
Coenina dentataria Swinhoe 1904
Colocleora divisaria divisaria (Walker 1860)
Colocleora faceta (Prout LB 1934)
Coleocleora leucostephana Prout
Cophophlebia olivata Warren 1894
Drepanogynis glaucichorda Prout LB 1916
Epigynopteryx anophthalma
Epigynopteryx flavedinaria Guenee

Epigynopteryx maeviaria maeviaria (Guenee 1857)
Epigynopteryx termininota Prout 1934
Erastria madecassaria (Warren 1897)
Iodes flexilinea Warren 1898
Isturgia deeraria (Walker 1861)
Isturgia exospilata (Walker 1861)
Menophra aborta aborta (Warren 1898)
Micrologia lutetincta Prout LB 1916
Micrologia murphyi Kruger 2002
Nopia flexilinea Warren
Oedicentra albipennis Warren 1902
Odontopera integraria Guenee
Odontoptera ochroneura dicyrta Prout 1938
Omizodes ocellata Warren 1894
Orbamia subaurata Warren 1899
Oreometra vittata Aurivillius 1910
Pareclipsis anophthalma Prout LB 1916
Plateoplia acrabelia (Wallengren 1875)
Psilocera pulverosa (Warren 1894)
Psilocera semirufa Warren 1901
Pycnostega obscura Warren 1905
Rhodophthitus thespinus Prout LB 1931
Semiothisa subcurvaria Mabille 1897
Sphingomima varia Prout LB 1915
Xanthis tarsispina Warren
Xanthisthisa fulva Warren 1902
Xenimpia maculosata (Warren 1897)
Xylopteryx arcuata (Walker 1862)
Xylopteryx aucilla Prout LB 1926
Xylopteryx interposita Warren
Xylopteryx gibbosa Herbulot 1973
Zamaranda arguta Fletcher 1974
Zamerada crysopa Fletcher 1975
Zamarada densisparsa Prout LB 1922
Zamerada dentigera Warren 1909
Zamerada dorsiplaga Prout LB 1922
Zamerada euerces Prout LB 1928
Zamerada fessa Prout LB 1912
Zamerada glareosa Bastelberger 1909
Zamerada metroscaphe Prout LB 1912
Zamarada polycytemon Prout 1932
Zamerada purimargo Prout LB 1912
Zamerada rubrifascia Pinhey 1962
Zamerada rufilineria Swinhoe 1904
Zamerada scintillans Bastelberger 1909
Zeuctoboarmia hyrax (Townsend 1952)
Zeuctoboarmia octopunctata (Warren 1897)
Zeuctoboarmia werneri Rebel 1917

Geometrinae

Celedomphax anaplaga (Warren 1905)
Chlorosterrha semialba Swinhoe
Heterorachis prouti Bethune-Baker 1913
Heterorachis simplicissima (Prout LB 1912)
Lophorrhachia rubricorpus (Warren 1898)
Mixocera xanthostephana Prout LB 1912
Omphacodes punctilineata (Warren 1897)
Paragathia albimarginata Warren 1902
Pingassa abyssinaria (Guenee [1858])
Pingassa murphyi Herbulot 1994
Prasinocyma nereis Townsend
Rhodophthitus roseovittatus Butler
Victoria mirabilis Warren 1911

Larentiinae

Asthenotricha dentatissima Warren 1899
Eupithecia gradatilinea Prout LB 1916
Eupithecia infectaria (Guenee [1858])
Gonanticlea meridionata meridionata (Walker 1862)
Larentia cf. bitrita (Felder & Rogenhoffer 1875)
Larentia sublesta Prout
Mimoclista annulifera Warren
Mimoclysta pudicata (Walker 1862)
Piercia bryophilaria (Warren 1903)
Piercia ciliata Janse 1933
Piercia impunctata Janse
Piercia pracinaria (Warren 1901)
Pseudolarentia megalaria (Guenee 1858)
Scotopteryx nictictaria (Herrich-Schaffer 1855)
Xanthorhoe exorista Prout LB 1922

Sterrhinae

Chlorerythra rubiplaga Warren 1895
Problepsis aegretta Felder & Rogenhoffer 1875

Problepsis catonaria (Guenee [1858])
Scopula latitans Prout LB 1920
Scopula opicata (Fabricius 1798)
Somatina sedata Prout LB 1922

Oenochrominae

Carteletis libyssa ethelinda K

Hepialidae

Antihepialus keniae Holland
Gorgopsis abbotti Holland
Gorgopsis caffra Walker 1856

Lasiocampidae

Bombycopsis indecora Walker 1865
Diapalpus congreganus Strand 1913
Dipluriella songeana Strand 1913
Epicnapteroides lobata Strand 1913
Eucaera gemmata (Distant 1897)
Eutricha fulgurata (Aurivillius 1915)
Eutricha seriofasciata Aurivillius 1921
Gonometa griseocincta Hampson 1910
Lebeda mustelinia Distant 1899
Lechriolepis basirufa Strand
Mimopacha bryki Aurivillius
Nadiasa cuneata (Distant 1897)
Odontocheilopteryx myxa Wallengren 1860
Odontocheilopteryx pattersoni Tams 1926
Opisthodontia cymographa (Hampson 1910)
Pachymetana sanquicincta (Aurivillius 1901)
Philotherma rufescens Whichgraff 1921
Pseudolyra lineadentata (Bethune-Baker 1911)
Shausinna affinis Aurivillius 1910
Stenophatana marshalli Aurivillius 1909
Streblote craterum
Streblote fusca (Aurivillius 1905)
Streblote pachyla Tams
Streblote vesta Druce 1888
Trabala charon Druce 1910

Limacodidae

Chrysopolominae
Chrysopoloma isabellina Aurivillius 1895

Ectropinae

Ectropa ancillis Wallengren 1863

Limacodinae

Afraltha chionostola (Hampson 1910)
Afrobirthama reducta Herring M. 1928
Coenobasis amoena (Felder 1874)
Crothema gloriosa Hering
Crothema mormopis Meyrick
Cosuma polana Druce
Ctenolita melanosticta (Bethune-Baker 1909)
Ctenolita anacoapa Karsch
Delorchis viridiplaga Karsch
Latoia furfurca Hering
Lembopteris neglecta Hering
Omocena dollmani Westwood
Pantoctenia gemmans Felder 1874
Panoctenia prasina (Butler 1896)
Parasa karschi Dyar
Parasa lanceolata Hering
Parasa latisriga Walker
Parasa Tamara Hering
Parasa vivida (Walker 1865)
Rhypteira hyperocha Tams
Stroter dukei Janse 1964
Susicina pyrocausta Hampson 1910

Lymantriidae

Agyrostroma niobe Weymer
Aroa discalis Walker 1855
Cimola opalina Walker 1855
Cropera stilpnarona Herring 1926
Euproctis crocosticta Hampson 1905
Eudasychira goodi Holland
Hyaloperina erythroma Coll
Laelia basalis (Walker 1855)
Laelia bifascia Hampson 1905
Laelia cuvivirgata (Karsch 1895)
Laelia fracta Shaus & Clements 1893
Leucoperina impuncta Butler
Narona varipes (Walker 1865)
Psalis pennatula (Fabricius 1793)
Pteredoa monosticta (Butler 1898)
Rhyptopteryx rhodalipha (Felder 1874)
Rhyptopteryx rubripunctata Weymer 1892
Schalidomitra ambages Strand 1911
Stilpnaroma venosa Hering

Metarbelidae

Teragra guttifera Hampson 1910
Salengena narses Fawcett 1916

NOCTUIDAE

Noctuid moth *Rhaniphora* sp.
Michael Overton

Transferred Arctiids

Asota speciosa (Drury 1773)

Acontiinae

Amyna punctum (Fabricius 1794)
Eublemma baccalix (Swinhoe 1886)
Ozarba heliastis (Hampson 1902)
Ozarba megaplaga Hampson

Agaristinae

Agoma trimeni (Felder 1874)
Brephos nigrobasalis (Bartel 1903)
Brephos nyassana Bartel 1903
Chaetostephana rendalli Rothschild
Crameria amabilis (Drury 1773)
Ovios capensis (Herrich-Schaffer [1854])
Pseudopais nigrobasalis Bartel 1903
Tuerta rema Druce

Amphypyrinae

Busseola fusca (Fuller 1901)
Callopietra maillardi (Guenee 1862)
Callopietra yerburii Butler 1884
Conservula alambica Gaede 1915
Conservula minor Holland 1896
Mazuca roseistriga Fletcher
Phalerodes cauta (Hampson 1902)
Spodoptera littoralis (de Boisduval 1833)
Tumidifrontia casteneotincta Hampson 1902

Catocalinae

Achaea finita (Guenee 1852)
Anomis flava (Fabricius 1775)
Anomis sobulifera Guenee 1852
Anticarsia irrorata (Fabricius 1781)
Audea fatilega (Felder & Rogenhoffer 1874)
Cyligramma latona (Cramer 1775)
Davea humeralis (Hampson 1902)
Dysgonia angularis de Boisduval 1833
Dysgonia derogans (Walker 1858)
Ericeia inangulata (Guenee 1852)
Gracilodes caffra Guenee 1852
Halochroa eudela Fletcher DS 1963
Heliophisma maculilinea
Hypersypnoides congoensis Berio 1854
Hypocala deflorata (Fabricius 1794)

Hypropra capensis (Herrich-Schaffer 1850)
Leoniloma convergens Hampson 1926
Maxera marchalii (de Boisduval 1833)
Mocis undata (Fabricius 1775)
Ophiusa tirhaca (Cramer 1780)
Oraesia emarginata Fabricius 1794)
Orthreis divitiosa Walker 1869
Orthreis fullonia (Clerck 1764)
Orthreis materna (Linnaeus 1767)
Pandesma robusta (Walker [1858])
Rhandiphora cinctigutta (Walker 1862)
Remiga repanda (Fabricius 1794)
Serrododes partita (Fabricius 1775)
Sphingomorpha chlorea (Cramer 1777)
Trigonodes hyppasia (Cramer 1779)
Ulothrichopus hardyi Clifton

Eutellinae

Caligatus angasii Wing [1850]
Eutelia bowkeri (Felder & Rogenhoffer 1874)

Hadeninae

Brithysana speyeri (Felder & Rogenhoffer 1874)
Diaphone eumela (Stoll 1781)
Diaphone lampra Karsch 1894)
Leucania prominens Walker 1856
Leucania tacuna (Felder 1874)
Leucania uncinata (Gaede 1916)
Rougeotia praetexta Townsend
Vietteania torrentium (Guenee 1852)

Heliothinae

Helicoverpa armigera (Hubner [1809])
Heliothis xanthiata Walker 1865

Hypeninae

Dichromia mesomeleana (Hampson 1902)
Hypena laetalis Walker [1859]
Hypena senialis Guenee 1854
Hypena strigata (Fabricius 1798)
Rhynchina tinctalis (Zeller 1852)

Noctuinae

Agrotis segatum (Dennis & Schiffermuller 1775)
Agrotis contiguens (Warren 1914)
Amazonides ruficeps (Hampson 1903)
Mentaxya atritegulata (Hampson 1902)
Mentaxya ignicollis (Walker 1857)

Plusiinae

Chrysodexis acuta (Walker 1858)
Plusia fracta Walker 1858
Plusia limbiralea Guenee
Plusia sestertia (Felder & Rogenhoffer 1874)
Syngrapha circumflexa (Linnaeus 1767)
Tricoplusia orichalcea (Fabricius 1775)

Sarrothripinae

Blenina albifascia Pinhey 1968
Blenina squamifera (Wallengren 1860)

Notodontidae

Achaera ochribasis (Hampson 1910)
Antheua crocoepunctata Hampson 1910
Antheua simplex Walker 1855

Cerurina marshalli (Hampson 1910)
Chlorocalliope calliope (Hampson 1910)
Clostera violacearia (Janse 1920)
Desmeocaria congoana Auivillius 1900
Disracha persimilis (Hampson 1910)
Hampsonita esmeralda (Hampson 1910)
Heraia thalassina (Hampson 1910)
Odontoperas voeltzkowi Aurivillius
Polienus albescens Gaede
Scalmicauda bicolorata Gaede
Scalmicauda tessmanni Strand 1911
Tronotus bettoni Butler 1898

Pterophoridae

Pterophorus candidalis (Walker 1864)

Pyraloidea

Crambidae

Musotiminae

Panoctima angustalis Hampson

Noordinae

Viettessa margaritalis (Hampson 1910)

Nymphulinae

Argyractis sambesica (Strand 1909)

Pyraustinae

Calamochrous flavimarginalis Hampson 1913

Loxostege plumbialis (Zeller 1852)

Loxostege venustalis Cramer 1782

Pyrausta incoloralis (Guenee 1854)

Uresiphita polygonalis (Dennis & Schiffermuller 1775)

Spilomelinae

Aetholessa floralis (Zeller 1852)

Bocchoris inspersalis (Zeller 1852)

Dichocrocis polystidzalis Hampson 1918

Epipagis cancellalis (Zeller 1852)

Eurrhyarodes tricoloralis (Zeller 1852)

Filodes costivitalis Guenee 1862

Ischnurges lancinalis (Guenee 1854)

Maruca vitrata (Fabricius 1787)

Marwitzia centiguttalis Gaede

Nausinoe argyrosticta (Hampson 1910)

Nausinoe geometralis (Guenee 1854)

Pagyda salvalis Walker 1859

Pagyda traducalis (Zeller 1852)

Palpita unionalis (Hubner 1796)

P1lochrosis dichocrosialis Hampson 1912

Spoladea recurvalis (Fabricius 1775)

Syllepte ovalis (Walker 1859)

Syllepte purpurascens Hampson 1899

Syllepte sinuata Fabricius

Synclera traducalis (Zeller 1852)

Syngamia convulsa Meyrick

Syngamia fervidalis Zeller 1852

Pyralidae

Phycitinae

Cadra cautella (Walker 1863)

Dysphilia viridella Ragonot 1888

Pyralinae

Aglossa rhodalis Hampson 1906

Saturniidae

Athletes gigas Sonthonnax 1904

Athletes semialba Sonthonnax 1904

Aurivillius seydelli Rougeot 1962

Bunaea alcinoe (Stoll 1780)

Cirina forda (Bouvier 1927)

Decachorda fulvia (Druce 1886)

Decachorda rosea Aurivillius 1898

Epiphora kipengerensis Darge

Gonimbrasia flammeola Darge

Gonimbrasia macrops (Rebel 1917)

Gonimbrasia macrothyris (Rothschild 1906)

Gonimbrasia murphyi Darge 1992

Gonimbrasia rectalineata (Sonthonnax 1899)

Gonimbrasia staudingeri (Aurivillius 1893)

Gonimbrasia wahlbergi (Boisduval 1847)

Gynanisa albescens Sonthonnax 1904

Holocerina smilax (Westwood 1849)

Imbrasia ertli Rebel 1904

Lobobunaea phaedusa falcatisissima Rougeot 1962

Ludia delegorguei (Boisduval 1847)

Ludia orinoptena Karsch 1892

Micragonei nyasae Rougeot 1962

Orthogonioptilum adiegatum dollmanni Jordan 1922

Pseudaphelia ansorgei (Rothschild 1898)

Pseudimbrasia deyrollei (Thomson 1858)

Pseudobunnaea callista Jordan 1910

Pseudobunnaea fumida Darge

Pseudobunnaea irius Fabricius 1793

Pseudobunnaea tyrrhena maculata Bouvier 1930

Tagoropsis hannintoni Butler 1893

Tagoropsis ikondae nyikensis Bouyer 2002

Ubaena dolabella (Druce 1886)

Sphingidae

Acherontia atropus (Linnaeus 1758)

Agrius convolvuli (Linnaeus 1758)

Andriasa contraria contraria Walker 1856

Andriasa mitcheli Hayes 1973

Basiothia charis (de Boisduval [1875])

Basiothia medea (Fabricius 1781)

Basiothia schenki Moschler 1872

Cephanodes hylas virescens (Wallengren 1858)

Chaerocina doherlyi meridionalis Carcasson 1968

Coelonia fulvinotata (Butler 1875)

Daphnis nerii Linnaeus 1758

Dovania poecila Rothschild & Jordan 1916

Euchloron megaera Linnaeus 1758

Falcatula falcatulus Rothschild & Jordan 1903

Hippotion celerio (Linnaeus 1758)

Hippotion eson (Cramer 1779)

Hippotion osiris (Dalman 1823)

Leptoclanis pulchra Rothschild & Jordan 1903

Leucophlebia afra Karsch 1891

Leucostrophus alterhirundo D'Abrera 1987

Lophostethus dumolinii dumolinii (Angas 1849)

Macroglossum trochilus (Hubner 1823)

Macropoliana ferax (Rothschild & Jordan 1916)

Neopolyptychus compar Rothschild & Jordan 1903

Nephele accentifera Beauvois 1805
Nephele comma Hopffer 1857
Nephele lannini Jordan 1926
Nephele peneus (Cramer 1776)
Nephele vau (Walker 1856)
Polyptychopsis marshalli (Rothschild & Jordan 1903)
Polyptychus baxteri Rothschild & Jordan 1907
Polyptychus corydoni Rothschild & Jordan 1903
Praedora plagiata Rothschild & Jordan 1903
Pseudoclanis kenyae Clark 1928
Rhodafra marshalli Rothschild & Jordan 1903
Sphingonaepiopsis ansorgei Rothschild 1904
Temnora burdoni Carcasson 1968
Temnora elegans polia Rothschild 1904
Temnora funebris (Holland 1893)
Temnora plagiata fuscata Rothschild & Jordan 1902
Temnora pseudopylas Rothschild 1894
Temnora pylades tangaNyikae Clark 1928
Temnora marginata (Walker 1850)
Theretra orpheus (Herrich-Schaffer 1854)

Thyretidae

Automolis laterita Herrich-Schaffer 1855
Automolis pallens Bethune baker
Thyretes negus Wallengren

Thyrididae

Chrysotopus dawsoni Distant 1897

Yponomeutidae

Yponomeuta strigillata Zeller 1852

Zygaenidae

Lamprochrysa triplex (Plotz 1880)
Saliunca esmeralda
Saliunca styx (Fabricius 1775)

Rhopalocera (Butterflies)

Hesperiidae

Abantis paradisea (Butler 1870)
Abantis zambesiaca (Westwood 1874)
Acada biseriatus (Mabille 1893)
Acleros mackenii (Trimen 1868)
Ampitta capenas capenas (Hewitson 1863)
Artitropa milleri Riley 1925
Artitropa reducta Aurivillius 1925
Borbo borbonica borbonica (Boisduval 1833)
Borbo fallax (Gaede 1916)
Borbo gemella (Mabille 1884)
Borbo micans (Holland 1896)
Borbo perobscura (Druce 1912)
Borbo sirena (Evans 1937)
Brusa allardi Berger 1967
Calleagris hollandi (Butler 1897)
Calleagris jamesoni jamesoni (Sharpe 1890)
Celaenorrhinus galenus (Fabricius 1793)
Celaenorrhinus handmani Berger 1976
Celaenorrhinus zanza Evans 1937
Chomdrolepis niveicornis Plotz 1883
Chomdrolepis telsingata (Butler 1896)

Coeliades forestan (Stoll 1872)
Coeliades pistratus (Fabricius 1793)
Fresna nyassae (Hewitson 1878)
Gegenes niso brevicornis (Plotz 1884)
Gomalia elma (Trimen 1862)
Gorgyra bibulous Riley 1929
Gorgyra johnstoni (Butler 1894)
Kedestes barbarae barbarae (Trimen 1873)
Kedestes brunneostriata (Plotz 1884)
Kedestes callicles (Hewitson 1868)
Kedestes wallengrenii fenestratus (Butler 1894)
Metisella decipiens (Butler 1896)
Metisella formosus formosus (Butler 1894)
Metisella medea Nyika Evans 1937
Metisella orientalis orientalis (Aurivillius 1925)
Metisella perexcellens perexcellens (Butler 1896)
Metisella quadrisignatus quadrisignatus (Butler 1894)
Meza larea (Neave 1910)
Parosmodes morantii morantii (Trimen 1873)
Platylesches ayresii (Trimen 1889)
Platylesches lambda Neave 1910
Platylesches picannini (Holland 1894)
Platylesches rasta rasta (Evans 1937)
Platylesches robustus robustus Neave 1910
Sarangesa astrigera Butler 1894
Sarangesa lucidella lucidella (Mabille 1881)
Semalea arela (Mabille 1891)
Semalea pulvina (Plotz 1879)
Spialia depauperata depauperata (Strand 1911)
Spialia dromus (Plotz 1884)
Spialia mafa mafa (Trimen 1870)
Spialia spio (Linnaeus 1764)
Tagiades flesus (Fabricius 1781)
Teniorhinus harona (Westwood 1881)
Zenonia zeno (Trimen 1864)

Papilionidae

Papilio dardanus tibullus Kirby 1880
Papilio demodocus demodocus Esper 1798
Papilio jacksoni Nyika Cottrell 1963
Papilio mackinnoni isokae Hancock 1984
Papilio nireus lyaeus Doubleday 1845
Papilio ophidecephalus mkuwadzi Gifford 1961
Papilio pelodurus vesper Le Cerf 1924
Papilio phorcas Nyikanus Rothschild & Jordan 1903
Graphium angolanus angolanus (Goeze 1779)
Graphium leonidas leonidas (Fabricius 1793)

Pieridae

Appias Sabina phoebe (Butler 1901)
Belenois aurota aurota (Fabricius 1793)
Belenois creona severina (Stoll 1781)
Belenois rubrosignata kongwana Talbot 1943
Belenois thysa (Hopffer 1855)
Belenois zochalia agrippinedes (Holland 1896)
Catopsilia florella (Fabricius 1775)
Colias electo Strecker 1900
Colotis antevippe gavis (Wallengren 1857)
Colotis aurigineus (Butler 1883)
Colotis danae annae (Wallengren 1875)
Colotis dissociates (Butler 1897)
Colotis eris eris (Klug 1829)

Colotis euippe omphale (Godart 1819)
Colotis evenina casta (Gerstaecker 1871)
Colotis regina Trimen 1863
Eurema brigitta brigitta (Stoll 1780)
Eurema desjardinsii marshalli Butler 1898
Eurema hecabe solifera (Butler 1875)
Eurema mandarinula (Holland 1862)
Eurema regularis (Butler 1876)
Eurema senegalensis (Boisduval 1836)
Leptosia alcesta inalcesta Bernardi 1959)
Mylothris agathina agathina (Cramer 1779)
Mylothris crawshayi crawshayi Butler 1896
Mylothris ruppellii rhodesiana Riley 1921
Mylothris sagala dentatus Butler 1896
Nepheronia argia mhondana (Suffert 1904)
Nepheronia thalassina sinalata (Suffert 1904)
Pinacopteryx eriphia eriphia (Godart 1819)

Nymphalidae

Acraeinae

Acraea acara Hewitson 1865
Acraea acrita Hewitson 1865
Acraea acuta Howarth 1969
Acraea aganice montana Butler 1888
Acraea axina Westwood 1881
Acraea anacreon bomba Grose-Smith 1889
Acraea anemosa Hewitson 1865
Acraea caecilia pudora Aurivillius 1910
Acraea calderena calderena Hewitson 1877
Acraea encedon encedon (Linnaeus 1758)
Acraea epaea melina (Thurau 1903)
Acraea eponina (Cramer 1770)
Acraea goetzei Thurau 1903
Acraea insignis insignis Distant 1880
Acraea johnstoni johnstoni Godman 1885
Acraea leucopyga Aurivillius 1904
Acraea natalica Boisduval 1847
Acraea perenna thesprio Oberthur 1893
Acraea periphanes Oberthur 1893
Acraea pharsalus pharsaloides Holland 1892
Acraea pudorella detecta Neave 1910
Acraea scalivittata Butler 1896
Acraea serena Fabricius 1775
Acraea sotikensis Sharpe 1891
Acraea ventura ventura Hewitson 1877
Hyalites parei orangica Henning 1996
Pardopsis punctatissima (Boisduval 1833)

Daninae

Amauris albimaculata latifascia Talbot 1940
Amauris crawshayi crawshayi Butler 1897
Amauris echeria serica Talbot 1940
Amauris ellioti junia (Le Cerf 1920)
Danaus chrysippus egyptus (Schreber 1759)
Tirumala Formosa formosa (Godman 1880)

Satyrinae

Aphysoneura pigmentaria obnubila Riley 1923
Bicyclus anynana anynana (Butler 1879)
Bicyclus campina campina (Aurivillius 1901)
Bicyclus cooksoni (Druce 1905)
Bicyclus cottrelli Van Son 1952

Bicyclus dancklemani (Rogenhoffer 1891)
Gnophodes betsimena diversa (Butler 1880)
Henotesia simonsii (Butler 1877)
Henotesia ubenica Thurau 1903
Melanitis leda helenae (Westwood 1851)
Melanitis libya Distant 1882
Neita extensa (Butler 1898)
Neocoenyra gregorii Butler 1894
Physcaeneura pione Godman 1880
Ypthimomorpha itonia (Hewitson 1865)

Argynninae

Issoria smaragdifera smaragdifera (Butler 1895)
Lachnoptera ayresii Trimen 1879
Phalantha aethiopica Rothschild & Jordan 1903

Nymphalinae

Antanartia dimorphica dimorphica Howarth 1966
Antanartia schaeneia dubia Howarth 1966
Catacroptera cloanthe cloanthe (Stoll [1781])
Cynthia cardui (Linnaeus 1758)
Junonia artaxia Hewitson 1864
Junonia hierta cebrene Trimen 1870
Junonia natalica (Felder 1860)
Junonia orithya orithya (Linnaeus 1758)
Junonia terea elgiva Hewitson 1864
Junonia touhilimasa Vuillot 1892
Junonia tugela aurorina Butler 1894
Precis antilope (Feisthamel 1850)
Precis archesia (Cramer 1779)
Precis cuama Hewitson 1864
Precis octavia sesamus (Trimen 1883)
Salamis anacardii nebulosa Trimen 1881
Salamis parhassus (Drury 1782)
Vanessa cardui Linnaeus 1758

Limnitiinae

Bebearia orientis orientis (Karsch 1895)
Byblia anvataracheloia (Wallengren 1857)
Byblia ilithya (Drury [1773])
Crenidomimas concordia (Hopffer 1855)
Cymothoe cottrelli Rydon 1980
Cyrestis Camillus sublineata Lathy 1901
Euphaedra crawshayi Butler 1895
Eurytella dryope angulata Aurivillius 1898
Euritella hiarbas lita Rothschild & Jordan 1903
Hamanumida daedalus (Fabricius 1775)
Harma theobene blassi (Weymer 1892)
Neptidopsis ophione ophione (Cramer [1777])
Neptis alta Overlaet 1955
Neptis aurivillii Schultz 1930
Neptis incongrua incongrua Butler 1896
Neptis laeta Overlaet 1955
Neptis melicerta (Drury 1773)
Neptis saclava marpeasa Hopffer 1855
Pseudacraea deludens murphyi Hecq 1991
Pseudacraea lucretia expansa (Butler 1878)
Pseudargynnis hegemon (Godart 1819)
Sallya amulia rosa (Hewitson 1877)
Sallya boisduvali boisduvali (Wallengren 1857)
Sallya garega (Karsch 1892)
Sallya morantii morantii (Trimen 1881)

Charaxinae

Charaxes achaemenes achaemenes Felder & Felder 1867
Charaxes acuminatus Nyika Van Someren 1963
Charaxes ameliae amelina Joicey & Talbot 1925
Charaxes ansorgei levicki Poulton 1933
Charaxes aubyni australis Van Someren & Jackson 1957
Charaxes baumannii whytei Butler 1894
Charaxes bohemani Felder & Felder 1859
Charaxes brutus natalensis Staudinger 1885
Charaxes candiope candiope Godart 1924
Charaxes castor flavifasciatus Butler 1895
Charaxes dowsetti Henning 1989
Charaxes druceanus proximans Joicey & Talbot 1922
Charaxes fione Henning 1977
Charaxes howarthi Minig 1976
Charaxes guderiana guderiana (Dewitz 1879)
Charaxes jasius saturnus Butler 1866
Charaxes macclounii Butler 1895
Charaxes nichetes leoninas Butler 1895
Charaxes nyikensis van Someren 1975
Charaxes phaeus Hewitson 1877
Charaxes pollux geminus Rothschild 1900
Charaxes protoclea azota (Hewitson 1877)
Charaxes varanes vologesis (Mabille 1876)
Charaxes violetta melloni Fox 1963
Charaxes xiphares ludovici Rousseau-Decelle 1933
Viridixes eupale veneris (Drury 1782)

Lycaenidae

Actizera lucida (Trimen 1883)
Actizera stellata (Trimen 1883)
Alaena nyassa major Oberthur 1888
Alaena reticulata Butler 1896
Aloedes conradi angoniensis Tite & Dickson 1968
Aloedes griseus Riley 1921
Aloedes molomo handmani Tite & Dickson 1973
Anthene amarah amarah (Guerin-Meneville 1847)
Anthene definita definita (Butler 1899)
Anthene kersteni (Gerstaecker 1871)
Anthene lasti (Grose-Smith & Kirby 1894)
Anthene ligures (Hewitson 1874)
Anthene liodes (Hewitson 1874)
Anthene lunulata (Trimen 1894)
Anthene rubricinctus anadema (Druce 1905)
Aphnaeus erikssoni rex Aurivillius 1909
Aphnaeus marshalli Neave 1910
Axiocerces amanga amanga (Westwood 1881)
Axiocerces Nyika Quickelberge 1984
Axiocerces punicea punicea (Grose-Smith 1889)
Axiocerces tjoane tjoane (Wallengren 1857)
Azanus jesous (Guerin 1847)
Azanus mirza (Plotz 1880)
Azanus moriqua (Wallengren 1857)
Azanus natalensis (Trimen 1887)
Cacyreus lingeus (Stoll 1782)
Cacyreus palemon (Stoll 1782)
Cacyreus virilis Stempffer 1936
Capys brunneus brunneus Aurivillius 1916
Capys connexivus connexivus Butler 1987
Cupidopsis cissus (Godart 1824)
Cupidopsis Jobates jobates (Hopffer 1855)
Deudorix antalus (Hopffer 1855)
Deudorix caerulea Druce 1890

Deudorix camerona Katanga Glench 1965
Deudorix dinochares Grose-Smith 1887
Deudorix diocles Hewitson 1869
Deudorix kafuensis Neave 1910
Deudorix lorisona coffea Jackson 1966
Deudorix magda Gifford 1963
Deudorix Montana (Kielland 1985)
Deudorix zelooides Butler 1901
Eicochrysops eicotrochilus Bethune-Baker 1924
Eicochrysops messapus mahallakoaena (Wallengren 1857)
Euchrysops barkeri (Trimen 1893)
Euchrysops dolorosa (Trimen 1887)
Euchrysops malathana (Boisduval 1833)
Euchrysops subpallida Bethune-Baker 1923
Euchrysops unigemmata (Butler 1895)
Harpencyreus hazelae Stempffer 1973
Harpencyreus junio (Butler 1897)
Harpencyreus marungensis marungensis (Joicey & Talbot 1924)
Hemiolaus caeculus caeculus Hopffer 1855
Hypolycaena buxtoni Hewitson 1874
Hypolycaena auricostalis auricostalis (Butler 1897)
Hypolycaena pachalica Butler 1888
Hypolycaena philippus philippus (Fabricius 1793)
lolaus (Epamera) alienus alienus Trimen 1898
lolaus (Stugeta) bowkeri nyasana (Talbot 1935)
lolaus (Epamera) congdoni Keilland 1985
lolaus (Argiolaus) lalos lalos (Druce 1896)
lolaus (Epamera) nasisii (Riley 1928)
lolaus (Argiolaus) pamela Heath 1983
lolaus (Epamera) sidus Trimen 1864
lolaus (Argiolaus) silarus Druce 1885
lolaus (Argiolaus) stewarti Heath 1985
lolaus (Epamera) violacea (Riley 1928)
Lachnocnema bibulus (Fabricius 1793)
Lachnocnema durbanii Trimen 1887
Lampides boeticus (Linnaeus 1767)
Lepidochrysops chalceus Quickelberge 1979
Lepidochrysops cupreus (Neave 1910)
Lepidochrysops desmondi Stempffer 1951
Lepidochrysops handmanni Quickelberge 1980
Lepidochrysops intermedia cottrelli Stempffer 1954
Lepidochrysops Nyika Tite 1961
Lepidochrysops solwezi (Bethune-Baker 1922)
Leptotes jeanneli (Stempffer 1935)
Leptotes marginalis (Stempffer 1944)
Leptotes pirithous pirithous (Linnaeus 1767)
Lycaena phlaeas abbottii (Holland 1892)
Mimacraea marshalli marshalli Trimen 1898
Ornipholidotes peucetia peucetia (Hewitson 1866)
Pentilla tropicalis (Boisduval 1847)
Phlaria heritsia virgo (Butler 1896)
Spindasis homeyeri (Duitz 1887)
Spindasis mozambica (Bertolini 1850)
Spindasis victoriae Butler 1884
Triclema nigeriae (Aurivillius 1905)
Tuxentius calice calice (Hopffer 1885)
Tuxentius ertli (Aurivillius 1907)
Pseudonacudaba sichela sichela (Wallengren 1857)
Uranothauma antinorii felthami (Stevenson 1934)
Uranothauma cordatus (Sharpe 1892)
Uranothauma crawshayi Butler 1895)
Uranothauma cuneatum Tite 1953
Uranothauma falckensteni (Dewitz 1879)
Uranothauma nubifer (Trimen 1895)
Uranothauma poggei (Dewitz 1879)

Uranothauma vansomeri Stemffer 1951
Uranothauma williamsi Carcasson 1961
Zizeeria Knysna (Trimen 1862)
Zizula hylax (Fabricius 1775)

Riodinidae

Abisara neavei cf congdoni Keilland 1985

Hymenoptera (Bees & Wasps)

Bees

Anthrophoridae

Amegilla acraensis Fabricius 1793
Amegilla torrida Smith
Anthrophora plumipes Fabricius
Mesotrichia flavorufa D & G
Xylocopa caffra Linnaeus 1767
Xylocopa corinata Smith 1874
Xylocopa flavobicincta Grib
Xylocopa lugubris Gerstaecker 1857
Xylocopa nigrita (Fabricius 1775)
Xylocopa senior senior (Vaehal 1899)

Apidae

Apis mellifera monticola Smith
Apis mellifera scutellata Lepeltier
Thyreus abyssinicus (Radoszkowsky)
Thereus calceatus (Vaehal)

Megachilidae

Chalicodoma bombifrons (Gerstaecker 1857)
Chalicodoma pseudomegachile kigonserana
 (Friese 1903)
Megachile felina Gerstaecker

Wasps

Brachonidae

Archbracon servillei Brulle
Serraulax decemmaculatus Szepliget 1911

Ichneumonidae

Asprynchotus guenzii (Tasch)
Enicospilus pacificus

Mutillidae

Stenomutilla cf beroe Peringuey

Pompilidae

Anopilus fuscus
Hemipepsis dedjas Guerin
Hemipepsis imperialis Smith
Hemipepsis ochropus Stal
Hemipepsis tamisieri Guerin
Psammochares plumbeus Fabricius
Psammochares cf semirufus Haupt
Pseudogenia flavotegulata Bingh

Scolidae

Campsomeris hymenaea Gerst
Megameris labilis Schulz 1906
Scolia erithropyga

Scolia morio Fabricius
Scolia Tropicana nigersima

Sphecidae

Ammophila benniensis (Palisot de Beauvois)
Ammophila punctaticeps (Arnold)
Chalybion laevigatum Kohl
Chlorion haemorrhoidalis Fabricius
Chlorion pelopoeiformis Dahlboom
Liris pempesiana Bisch
Philanthus stygius Gerstaecker
Philanthus triangulatum diadema Fabricius
Podolonia tydei Le Guillay
Scelifron spirifex Linnaeus
Trachysphex ambiguous Arnold 1923

Vespidae

Ancistrocerus lineaticollis Cam
Antipiona silgos (Saussure)
Belognaster clypeata Kohl 1894
Belognaster dubius Kohl
Belognaster fascialis du Buysson 1906
Belognaster filiventris Saussure 1853
Belognaster griseus Fabricius
Belognaster laevigatum Kohl
Belognaster nobilis Gerstaecker

Belognaster vasseae du Buysson 1906
Delta emarginata
Delta pulchemimum
Eumenes maxillosus De Geer



Epilachna dregei

Odynerus ardens var junodi Gribodo 1895
Odynerus radialis Saussure 1854
Odynerus ventralis Saussure
Polistes marginalis Fabricius
Polistes smithi Saussure
Trachymeus cf vulneratus
Synagris prosperina niassae Stadel

Formicoidea (Ants)

Report by Dr C.B.Cottrell in Biosearch 2000 edition

VWAZA MARSH GAME RESERVE**Odonata** (Dragonflies)

Zygoptera (Damsel flies)

Agriidae*Phaon irridipennis* (Burmeister 1939)

Anisoptera (Open winged dragonflies)

Gomphidae*Ictinogomphus ferax* (Rambur 1842)**Libellulidae***Brachythemis leucosticta* (Burmeister 1839)*Oplogastra lugubris* Karsch 1895*Palpopleura lucia* (Drury 1773)*Pantala flavescens* (Fabricius 1798)*Philonomon luminans* (Karsch 1893)*Thylomis tillarga* (Fabricius 1798)*Tramea basilaris* Beauvois 1817**Blattodea** (Cockroaches)*Balta ruficeps* Kirby 1900*Gyna cafferum* Stal*Gynopeltes cryptospila* (Walker)**Orthoptera** (Grasshoppers & crickets)**Gryllotalpidae** (Mole crickets)*Gryllotalpa Africana***Tettigoniidae***Terpnistria zebrata***Hemiptera** (Bugs)

Heteroptera (Stink bugs/Assassin bugs)

Alydidae*Tupalus fasciatus* Dall**Belastomatidae***Limnogeton ezpansum* Mont**Coreidae***Anoplocnemis curvipes* Fabricius**Hydrophilidae***Temnopterus spinipennis* Gory**Pentatomidae***Halyomorpha bimaculata* Bergroth**Pyrrhocoridae***Probergrothius latus* Stahlik**Reduviidae***Neovarius varus* Walker*Rhinocoris albipunctatus* Stal 1855**Homoptera** (Plant bugs)**Cicadidae***Brevisana niveonotata* Bates*Ioba leopardina* (Distant 1881)*Monomatapa insignis* Distant*Platypleura marshalli* (Distant 1897)*Platypleura shoutedeni* Distant*Ugada inquinata* Distant**Circopidae***Hemitricophora strongii* Hope*Locris jugalis* Jacobi**Fulgoridae***Druentia sicca* (Walker)*Hypselomatopum Karschi* (Schmidt)*Richnophloe renata* Distant*Zanna claviticeps* (Karsch)*Zanna pustulosa* Gersteaker*Zanna tenebriosa* (Fabricius)**Ricaniidae***Lugardia mimica* Distant 1909*Privessa cixii* Walker**Neuroptera** (Ant lions)**Ascalaphidae***Abascalaphus nigripes* (Van der Weele 1909)*Disparomitis brevistigma* (Ebsen-Peterson 1931)*Nephoneura costalis* Van der Weele 1908*Phalascusia vassei* Van der Weele*Tmesibasis lacerata* Hagen**Mantispidae***Pseudoclimaciella loanga* Navas**Myrmeliontidae***Distoleon posterior* Navas 1931*Hagenomyia tristis* (Walker 1853)*Lachlethetes moestes* (Hagen 1853)*Macronemurus euanthe* Banks 1911*Myrmeleon lethifer* Walker 1853**Psychopsidae***Silveria marshalli* McLachlan**Coleoptera** (Beetles)

Adephaga (Predatory beetles)

Carabidae*Craspadophorus unicolor* Chd*Cypholoba graphipteroides kigonserana*

Stolus

Thermophilum fornasinii Bertoloni**Cicindelidae***Bennigsenium discoscriptum* W Horn 1913*Chaetodera regalis regalis* (DeJean 1831)*Cylindera marshallisculpta* (W Horn 1913)

Cylindera ocellifera (W Horn 1905)
Dromica mesothoracica W Horn 1909
Dromica murphyi Werner & Schule 2001
Dromica rawlini Schule & Werner 2001
Elliptica compressicornis (Boheman 1860)
Elliptica longestiata katagana Baiselewsky 1962
Euryarthron gerstaeckeri seydeli Baiselewsky 1963
Lophyra bertolonia (W Horn 1915)
Lopyra clathrata (DeJean 1825)
Lophyra neglecta intermedia (W Horn 1921)
Megacephala regalis viridissima Baiselewsky 1966
Myriochila georgewerneri Werner 1988
Myriochila melancholica (Fabricius 1798)
Prothyma guttipennis Boheman 1848
Prothymedia angusticollis Boheman 1848
Pseudodromica marshalli (Peringuey 1894)
Trichodela diversilabris Cassola 1995

Dytiscidae

Copelatus sudrei Bameul 2003

Polyphaga (Leaf eating & other beetles)

Anthribidae

Philoeotragus heros Fabricius
Xylinada maculipes Fahroeus

Buprestidae

Evides rubriventris
Neojulades vittipennis Fahroeus 1851
Psiloptera amaurotica Klug
Psiloptera subcatenulata
Sphenoptera valida Jakobson
Sternocera orissa variabilis Kerrymans 1886

Cerambycidae

Cerambycinae
Africophanes fasciatus Bilberg
Allogaster unicolor Gahan
Apiogaster posticulum Jordan
Apiogaster similis Gahan
Bottega rubra Aurivillius 1922
Cloniophorus nyassae (Bates 1878)
Clostomerus claviger Dalman 1817
Colobizus bicolor Schmidt
Coptoeme krantzi (Distant 1898)
Cordylomera annulicornis Fairmaire
Cordylomera gracilis Veiga-Ferreira
Cordylomera inornata Duffy 1952
Cordylomera schoeneherri Fabricius
Derolus atenaurius Breunning
Derolus brunneipennis (Gahan 1904)
Derolus puchneri Adlbauer
Derolus sabaureus
Derolus sulcatus Arivillius
Helymaeus notaticollis Perroud
Hypargyra cribipennis Gahan
Margites deroliformis Adlbauer
Meridionoeda africana aethiopica Adlbauer
Metallyra nitidicollis Gestro
Micrambyx ferrori Maugli
Neoplocaederus spinicornis Fabricius 1781
Ossibia cyanoptera Aurivillius
Ossibia fuscata Chevrolat
Ossibia maurina (Gerstaecker 1855)

Oxylus gazella Jordan
Paroeme meridionalis Adlbauer 1994
Pelidnopedilon protractum
Purpuricerus laetus Thomson 1864
Synaptola nitidipennis Gahan
Xystrocera globosa Olivier
Xystrocera laeta Peringuey 1892
Xystrocera nigrita Serville
Xystrocera vittata (Fabricius 1792)
Zoodes liturifer

Lamiinae

Aethiopica lesnei Breuning
Apomecyna binubila Pascoe
Apomecyna latefasciata Quedenfeldt
Bareus orientalis (Aurivillius)
Ceroplesis aestuans Gerstaecker
Ceroplesis latevittata Fairmaire
Corus obscurus Breuning
Dichostathes compactus Fairmaire
Dichostathes lignarius lacunosus Fahroeus
Dirphya nigricornis Olivier
Emphreus pachystoloides Lacordaire
Eunidia basinigricornis subsimplicior Breuning
Eunidia brunneopunctata Aurivillius
Eunidia thomsoni Distant
Eunidia uniformis Breuning
Exocentrus echinulus ssp tanzicola Teocchi
Frea zambesiana Hintz
Freadelpha cinerea junodi Jordan
Hecyra obscurator Fabricius
Hillisia imitans Duvivier
Idactus strandi Breuning
Isochariesthes francoisi (Breuning)
Laziopezuz longimans (Thomson)
Laziopezuz nigromaculatus (Quedenfeldt)
Laziopezuz nigromaculatus ambiguus Kolbe
Nictocris juvenca Brancsik
Niphonia appendiculata Gerstaecker
Oberea trigonalis Breuning
Pachystola erinaceus Gahan 1894
Prosopocera cretaceus Jordan
Prosopocera gracillis Breuning
Prosopocera pylas Jordan
Prosopocera vitticollis Gahan
Pterolophia ingrata nyassana Sudre & Teocchi 2002
Pycnopsis brachyptera Thomson
Sophronica grisea densestictia Breuning
Stenophryneta cinerea Aurivillius
Tragocephala variegata Bertoloni 1849

Prioninae

Aulocopus natalensis White 1853
Aulocopus reticulatus (Serville)
Cantharocnemis livingstonei
Macrotoma natala Thomson 1860
Macrotomia palmata Fabricius 1792
Tithoes confinis Castelnau 1840

Chrysomelidae

Cassidinae
Aspidomorpha quadrimaculata Olivier
Aspidomorpha tecta Boheman

Clytrinae*Melitonoma tigrina* Bry**Galerucidae***Prosmidia conifera* Fairmaire**Coccinellidae***Declivitata oliveri* (Gerst)**Curculionidae***Brachycerus ornatus* Boli*Deiradognathus fasciatus* Marshall 1918**Elateridae***Aeoloderma cf trifasciatus* Candeze*Calais heiroglyphicus* Candeze*Calais levasseuri* Girard*Calais venustus* Girard*Neoclanis hacquardi* Candeze*Olophoeus massarti* Burgeon*Olophoeus rugosus* Schwartz*Podeonius hebetatus* Lauren & Taminiaux*Podeonius rutilis* Klug*Propsephus anoplischioides* Fleutiaux*Propsephus katanganus* Baisilewsky*Tetrolobus rotundifrons* Guerin**Grynidae***Dineutus aereus* Klug**Lucanidae***Nigidius amplicollis* Quedenfeldt 1884**Paussidae***Cutipaussus curtisi**Heteropaussus jeaneli* Rcnsp**Tenebrionidae***Distressus inflata***Scarabaeidae****Cetoniinae***Amaurodes passerini* Westwood 1844*Cheiriolasa burkei histrio* Bates 1881*Diplognatha silicea* (Macleay 1838)*Dolichostethus levis* (Janson 1877)*Dispilophora trivittata* Shaum 1841*Goliathus albosignatus* Boheman 1857*Leucocelis rhodesiana* Moser 1913*Marmylidia impressa* (Goldfuss 1805)*Pachnoda upangwana* Moser 1918*Porphyronata hebrae* (Olivier 1789)*Porphyronata maculatissima* (Boheman 1860)**Coprinae***Copris mesacanthus* Harold 1878*Onitis westermanni* Lansberge 1886*Onthophagus chlorophanus* d'Orbigny*Onthophagus ebenus* Peringuey 1888*Onthophagus emeritus* Peringuey [1901]*Onthophagus phimetarius* Rothschild 1851*Onthophagus quadrinodosus* Fahraeus 1857**Dynastinae***Cyphonistes gazanus* Prell*Rhizoplatys auriculatus* (Burmeister 1847)**Geotrupinae***Bolboceras gigas***Staphylinidae***Staphylinus nigriventris* Boheman**Diptera** (Flies)**Glossinidae** (Tsetse flies)*Glossina morsitans* Westwood 1851**Lepidoptera** (Moths & Butterflies)**Heterocera** (Moths)**Arctiidae***Argina amanda* (Boisduval 1847)*Alpenus investigatorum* (Karsch 1899)*Estigmene tenuistriga* Hampson 1900*Micralarctia punctulata* (Wallengren 1860)*Spilosoma lutescens* Walker 1855*Teracatona metaxantha* (Hampson 1909)**Transferred Arctiids***Grammarctia bilinea* (Walker [1865])**Cossidae***Azygophleps inclusa* Walker 1856*Azygophleps leopardina* Distant 1902**Ctenuchidae***Trichaeta pterophorina* (Mabille 1892)**Eupterotidae***Hoplojana rhodoptera* (Gerstaecker 1871)*Phasicnecus preussi**Phasicnecus roseus* (Druce 1866)*Phialia albidorsata* Gaede 1927*Phialia simplex* Aurivillius 1904*Stenoglene roseus* (Druce 1886)**Geometridae****Ennominae***Celidomphax analiplaga* (Warren 1905)*Chiasmia kilimanjarensis* (Holland 1892)*Chiasmia streniata streniata* (Guenee [1858])*Eulycia grisea* (Warren 1897)*Euxia percnopus* Prout LB 1915*Madecassaria natalensis* (Warren 1897)*Mauna perquista* Prout LB 1922*Omphalucha brunnea lignaria* Warren*Orbamia subaurata* Warren 1899*Phoenicocampha terinata* (Felder & Rogenhoffer 1875)*Pithia trifasciata* Dewitz 1881*Rhodophthitus commaculata* (Warren 1897)*Rhodophthitus simplex* Warren 1897*Psilocladia obliquada* Warren 1898*Zamarada aequilumata* Fletcher 1974*Zamarada arguta* Fletcher 1974*Zamarada glareosa* Bastleberger 1907

Zamarada ignicosta Prout LB 1912
Zamarada metrioscaphes Prout LB 1912
Zamarada phaeozona Hampson 1909

Geometrinae

Antharmostes papilio papilio Prout LB 1912
Celidomphax anaplaga (Warren 1905)
Celidomphax quadrimacula Janse 1935
Celidomphax rubrimaculata (Warren 1905)
Microbaena pulchra (Staudinger 1897)
Neurotoca notata Warren 1897
Rhodesia arboviridata Salmuller 1880
Thalassodes quadraria Guenee 1857
Victoria fuscithorax Warren 1905

Sterrhinae

Antitrigodes calibotrys Prout LB 1918
Isopenia trisinuata Warren 1897
Scopula opticata (Fabricius 1798)

Hablaeidae

Hablaea fontainei Berio 1967

Lasiocampidae

Chrysosopsyche ladburyi
Craspia marshalli Aurivillius 1909
Craspia wahlbergi Aurivillius 1909
Dollmania purpurascens (Aurivillius 1909)
Epitrabala nyassana (Aurivillius 1909)
Eucaera gemmata (Distant 1897)
Eutricha fulgurata (Aurivillius 1915)
Euwallengrenia rectilineata (Aurivillius 1905)
Grammadora nigrolineata (Aurivillius 1895)
Haplopacha cinerea Aurivillius 1905
Laeliopsis punctuligera Aurivillius 1911
Mesocelis monticola Hubner [1820]
Opisthodontia cymographa (Hampson 1910)
Sena prompta (Walker 1862)
Trichopisthia igneotincta (Aurivillius 1909)
Tricopistha monteiroi (Druce 1888)

Lemoniidae

Sabalia picarina Walker 1865

Limacodidae

Cosuma polana Druce 1887
Crothaema mormopsis Meyrick
Gavara velutina Walker [1858]
Latoia vivida (Walker 1865)
Lepidorytis sulcata Aurivillius 1900
Micraphe laterita Karsch 1896
Neomocoena convergens (Herring M 1928)
Neosothia rufimacula Joycei & Talbot
Omocoena syrtis Schaussure & Clemments
Parapluda invitabilis (Wallengren 1860)
Parasa latistriga Walker
Stroter dukei Janse 1964
Zinara discophora Hampson 1910

Lymantriidae

Aroa discalis Walker 1855
Aroa melanoleuca Hampson 1905
Barlowia charax (Druce 1896)
Crorema adspersa (Herrich-Schaffer 1854)
Hemerophanes diatoma (Hering M 1926)

Hemerophanes libyra flammeola (Distant 1899)
Homochira rendalli (Distant 1897)
Knappetra fasciata (Walker 1855)
Laelia fracta Shaus & Clements 1893
Lacipa melanosticta
Marblepsis flabellaria (Fabricius 1787)
Morasa modesta (Walker 1855)
Othroeda caffra Druce
Palacia albimacula Wallengren 1863
Polymona rufifimur Walker 1855
Schalidomitra ambages Strand 1911

Metarbelidae

Metarbela bisinuata
Metarbela dialeuca Hampson 1910
Salengena albonotata
Salagena tessellata Distant 1897

Noctuidae

Acontiinae

Acontia gratiosa (Wallengren 1856)
Acontia wahlbergi Wallengren 1856
Amyna puncta (Fabricius 1794)
Thyatirina achatina (Weyermer 1896)

Agaristinae

Aegoceropsis fervida (Walker 1854)
Agoma trimeni (Felder 1874)
Chekostephonia rendalli Rothschild 1896
Crameria amabilis (Drury 1773)
Heraclia butleri (Walker 1869)
Heraclia superba (Butler 1875)
Leucovis alba (Rothschild 1897)
Mitrophyrus latreilli (Herrich-Schaffer [1853])
Paraegocera confluens Weyermer

Amphipyriinae

Ectolopha viridescens Hampson 1902
Mazuka roseistriga Fletcher DS 1963
Mazuka strigicincta Walker 1866
Procrateria noloides Hampson 1905
Spodoptera littoralis (De Boisduval 1833)

Catocalinae

Anomis flava (Fabricius 1775)
Chalciope delta (de Boisduval 1833)
Colliodes pretiosissima Holland 1892
Cometaster pyrula (Hopffer 1859)
Cyligramma latona (Cramer 1775)
Entomogramma pardus Guenee 1852
Eudocyma materna (Linnaeus 1787)
Grammodes bifasciata (Petagna 1787)
Gracilodes caffra Guenee 1852
Hypopyra capensis Herrich-Schaffer 1850
Lacera alope (Cramer 1780)
Panagraptia albirenalis Guenee
Plecopterodes moderata (Wallengren 1860)
Remigiodes remigina Mabille
Rhandiphora odontophora Hampson 1926
Ogivia pudens (Holland 1894)
Sphingomorpha chlorea (Cramer 1777)

Chloephorinae

Arcyophora longivavis Guenee 1852
Neaxestis mesogonia

Cucullinae*Compsotata elegantissima* (Guenee 1852)**Hadeninae***Diaphone eumela* (Stoll 1781)**Hypeninae***Hypena laetalis* Walker [1859]*Hypena strigata* (Fabricius 1798)**Noctuinae***Masalia galathea* (Wallengren 1856)*Micragrotis strigibasis* (Hampson 1902)**Plusiinae***Chrysodeixis acuta* (Walker 1857)*Trichoplusia orichalcea* (Fabricius 1775)**Sarothripinae***Risoba diplogramma* Hampson 1912**Notodontidae***Afroplitis dasychirina* (Gaede 1928)*Atrasama rectilinea* (Gaede 1928)*Desmeocraera basalis* Distant 1899*Galona serena* Karsch 1895*Heraia thalassina* (Hampson 1910)*Rigema ornata* Walker 1865*Phalera imitata* Druce 1896*Sarimarias bicolor* (Distant 1899)**Pterosythanidae***Hibrildes venosa* Kirby 1896**Pyraloidea****Crambidae***Agathodes musivalis* Guenee 1854*Cadarena sinuata* (Fabricius 1781)*Filodes costivitrialis* Guenee 1862*Haritala obrinusalis* Walker*Leucinodes vagans* (Tutt 1890)*Zebronia phenice* (Stoll 1782)**Hyblaeidae***Hyblaea fontainei* Berio 1967**Pyralidae***Epilepia melanobasis* (Hampson 1906)*Mittonia hampsoni* (Distant 1897)*Sacada dipenthes* Meyrick**Saturniidae***Argema miomosae* (Boisduval 1847)*Athletes gigas* Sonthonnax 1904*Athletes semialba* Sonthonnax 1904*Bunaeopsis macrophthalma* Kirby [1881]*Bunaeopsis phidias* (Weymer 1909)*Cinabra hyperbius* (Westwood 1881)*Cirina forda* (Westwood 1849)*Epiphora mythimnia* (Westwood 1849)*Gonimbrasia zambesina* (Walker 1865)*Heniocha apollonia* (Cramer 1779)*Heniocha marnois* Rogenhofer 1891*Holocerina smilax* (Westwood 1849)*Imbrasia belina* (Westwood 1849)*Imbrasia ertli* Rebel 1904*Imbrasia nicitans* (Fabricius 1775)*Lobobunaea saturnus* (Fabricius 1793)*Pseudaphelia dialitha* Tams [1930]*Pseudobunaea irius* Fabricius 1793*Pseudobunaea pallens* Sonthonnax [1899]*Rohaniella pygmaea* (Massen & Weymer 1885)*Tagoropsis hanningtoni* Butler [1883]*Usta terpsichore* (Massen & Weymer 1885)**Sphingidae***Agrius convolvuli* (Linnaeus 1758)*Basiotha medea* Fabricius 1781*Batocnema africana* (Distant 1899)*Coelonia fulvotata* (Butler 1875)*Dap[hnis] nerii* (Linnaeus 1758)*Hippotion eson* (Cramer 1779)*Hippotion roseipennis* Butler 1882*Likoma apicalis* Rothschild & Jordan 1903*Litosphinga corticea* Jordan 1920*Lophostethus dumolinii* (Angas 1849)*Rhodafra marshalli* Rothschild & Jordan 1903*Macroglossom trochilus* (Hubner 1824)*Neopolyptychus compar compar* (R & J 1903)*Nephele accentifera* Palisot de Beauvois 1805*Nephele comma* Hopffer 1857*Pemba favillacea* (Walker 1856)*Phyloxiphia metria* (Jordan 1920)*Platysphinx piabilis* (Distant 1897)*Poliana wintgensis* (Strand 1910)*Polyptychus corydoni* R & J 1903*Praedora marshalli* R & J 1903*Praedora plagiata* R & J 1903*Praedora tropicalis* R & J 1903*Rufoclanis fulgurans* R & J 1903*Rufoclanis numosae subjectus* (Walker 1869)*Temnora natalis* Walker 1856*Theretra monteironis* (Butler 1862)*Xanthopan morgani* (Walker 1856)**Thaumetopoeidae***Anaphe clarilla* Aurivillius 1904*Thaumetopoea apologetica* Strand 1909**Thyrididae***Arniocera auriguttata* Hopffer 1857*Arniocera cyanoxantha elegans* (Weymer 1903)*Arniocera eriothropyga* (Wallengren 1860)*Arniocera lugubris* Gaede 1926*Cecidothyris pexa gutulata* Aurivillius 1910*Chrysotopus dawsoni* Distant 1897*Rhodoneura flavicillia* Hampson 1906*Rhodoneura sordidula* (Plotz 1880)**Zygaenidae***Saliunca esmeralda***Rhopalocera** (Butterflies)**Hesperiidae***Astictopterus stellata mineni* (Trimen 1894)*Borbo fatuellus* (Hopffer 1855)*Coeliades forestan forestan* (Stoll [1872])*Sarangesa lucidella* (Mabille 1891)*Sarangesa seineri* Strand 1909*Tagiades flesus* Fabricius 1781*Teniorhinus harona* (Westwood 1881)

Papilionidae

Graphium angolanus angolanus (Goeze 1779)
Graphium leonidas leonidas Fabricius 1793
Papilio demodocus demodocus Esper [1798]

Pieridae

Belenois aurota (Fabricius 1793)
Belenois creona severina (Stoll [1781])
Catopsilla florella (Fabricius 1775)
Colotis antevippe gavisa (Wallengren 1857)
Colotis evergore antigone (Boisduval 1836)
Colotis evenina casta Gerstaecker 1871
Colotis pallene (Hopffer 1855)
Colotis regina (Trimen 1863)
Eurema destarginsi marshalli Butler 1898
Eurema hecabe solifera (Butler 1875)
Pinacopteryx eriphia eriphia Godart [1819]

Nymphalidae**Acraeinae**

Acraea acara Hewitson 1865
Acraea acerata Hewitson 1874
Acraea acrita Hewitson 1865
Acraea anemosa Hewitson 1865
Acraea calderena Hewitson 1877
Acraea eponina (Cramer [1780])
Acraea natalica Boisduval 1847
Acraea neobule Doublday [1847]
Acraea serena (Fabricius 1775)
Pardopsis punctatissima (Boisduval 1833)

Charaxinae

Charaxes achaemenes achaemenes Felder & Felder 1867
Charaxes bohemani Felder & Felder 1859
Charaxes castor flavifasciatus Butler 1895
Charaxes howarthi Minig 1976
Charaxes guderiana guderiana (Dewitz 1879)
Charaxes jasius saturnus Butler 1866
Charaxes protoclea azota (Hewitson 1877)
Charaxes varanes vologesis (Mabille 1876)

Daninae

Danus chrysippus aegyptus (Schreber 1759)

Nymphalinae

Catacroptera cloanthe Stoll [1781]
Hypolimnas misippus Linnaeus 1764
Junonia antilope Feisthamel 1850



Pyrops claviticeps claviticeps

Junonia hierta cebrene Trimen 1870

Limentinae

Byblia anvataracheloia (Wallengren 1857)
Hamanumida daedalus (Fabricius 1775)
Neptis laeta Overleat 1955

Satyrinae

Bicyclus angulosa selousi (Trimen 1895)
Bicyclus ena (Hewitson 1877)
Henotesia simonsii Butler 1877
Melanitis leda helena (Westwood [1851])
Physcaeneura pione Godman 1880

Lycaenidae

Axiocerces tjoane (Wallengren 1857)
Cnodontes vansomeroni Stempffer & Bennet 1953
Epamera sidus Trimen 1864
Eurychrysops malathana (de Boisduval 1833)
Hypolycaena auriocostalis (Butler 1897)
Lachnocnema bibulus Fabricius 1793
Lampides boeticus (Linnaeus 1767)

Hymenoptera (Bees & Wasps)**Apoidea** (Bees)

Calicodoma bombifrons Gerst
Thyreus axillaris (Vachal)

Ichneumonidae (Parasitic wasps)

Euryophion meridionalis Morley 1912

THE BIOSEARCH TEAM

on the Nyika, at the beginning and at the end.



Peter Overton





Sunset for the day of the Big Walk, Vwaza Marsh

Marianne Overton