Issue 18: Spring 2014

Nyika-Vwaza News

The newsletter of the Nyika-Vwaza Trust and Nyika-Vwaza (UK) Trust

"working for the environment and wildlife conservation in northern Malawi"

Welcome to the Spring 2014 issue of Nyika-Vwaza News.

It was only when I read the article our new manager Sam Banda has written for us (see page 4) that I realised the Nyika-Vwaza Trusts celebrate their 10th anniversaries this year. Then I read Charity Kumwenda's report on the latest phase of the Nyika schools project (see page 2), which is being funded by the Foot Educational Fund. The children now realise, Charity writes, that this isn't a project that will come and go – it is real, meaningful and here to stay. So, not only are we still around after ten years but also we are continuing to deliver on our promises. These are great achievements.

And consider how we have evolved in that time. Park infrastructure maintenance remains a core task, and we are proud to continue to work alongside our Department of National Parks and Wildlife colleagues, building roads and bridges and operating the annual controlled burn programme. But, now, we also have a website that is an important portal for academic research materials on Nyika and Vwaza, and we have the active support of our patroni naturae, a body of scientific experts on the flora and fauna of both places. In more recent times, through the Foot Educational Fund, we have started to realise our vision of supporting local projects to enable Malawi's younger generations – from school children to university students – to appreciate the biodiversity of Nyika and Vwaza.

That we are where we are is down to you. Without the legacies, without the individual donations, without the funding from other charitable foundations, we simply would not exist – and neither would the many projects we manage on Nyika and in Vwaza. So, after ten years, it seems entirely appropriate that I should use this editorial to thank all of you who have given your time and your money to support us – and to encourage you to continue that support for another ten years and beyond!

Meanwhile, there is much to enjoy in this bumper issue of Nyika-Vwaza News. Support from our patroni naturae continues with a detailed review of the mammals of Nyika and Vwaza by David Happold (see page 8). The review includes an historical perspective to the study of mammals, a table of all the currently known species of mammal, and a brief survey of how Nyika and its mammals have changed over time. In contrast, if you love plants and flowers, you will be enchanted by ecologist Rosalind Salter's comparison of Nyika and Kitulo National Park (see page 5), a place known as Tanzania's Serengeti of Flowers . And of course you will find all the usual updates on recent events, upcoming events and projects.

With best wishes,

Jane Gallacher (Editor)

2014 Lecture – Hold the date!

Our annual lecture and promotional evening will take place on Thursday 6th November 2014 at The Royal Over Seas League in London. More details will be available nearer the time but, in the meantime, please do keep the date free in your diary.

News from the field

Our manager, Sam Banda (about whom you can read more on page 4), reports that February 2014 ranks as one of the wettest months of his lifetime, with rains pounding the Nyika plateau daily. Because of this, many animals have moved to areas away from camp. Although conditions have reduced working hours, our team has been able to make progress in a number of areas in the early part of the year. In particular:

- Drains were opened and some invasives and culverts cleared in the area towards the campsite.
- Eucalyptus and pine invasives were taken down near the workshop and hostel areas. Digging and removal of gum tree stumps is in progress on these sites.
- A small bridge leading to the Department of National Parks and Wildlife houses was rehabilitated.
- Road maintenance was undertaken on sections of the Chilinda Bridge road.
- Foundation trenching of a new staff house being funded by the Beit Trust was complete, as was the crushing of quarry stones. Concrete footing will be undertaken shortly and foundation brick-moulding is 80% complete. Construction of a wooden staff kitchen is also in progress.

Digging the foundations for the staff house

Staff kitchen construction in progress

Ecotourism and Conservation in Malawi: 2013 lecture

As always, our thanks to those who could make it to our lecture evening last year. It's crucial we have the chance to update as many of you as possible on our conservation work in Northern Malawi, and there is no way better way of doing this than by meeting face-to-face!

For the formal part of the evening, our chairman, Tom Lupton, gave an update on recent field activities on the Nyika and in Vwaza and then UK trustee Jennie Kettlewell gave a personal account of her visit to both places last year. The main event was Chris Badger, of Central African Wilderness Safaris, talking about "Ecotourism in Malawi – the Wilderness Story". Increasingly, conservationists and tourism operators must walk hand-in-hand to conserve biodiversity in precious places like the Nyika and Vwaza. Chris showed us how this worked from the Wilderness perspective. We are proud to have such a good working relationship with him and his team, and grateful to Chris for taking the time to talk to us. Finally, we were delighted that His Excellency, Mr Bernard Sande, the Malawi High Commissioner, agreed to take the podium to wrap up the formalities of the evening. We are very lucky always to have had the Malawi High Commission's full support for our events.

His Excellency, Mr Bernard Sande
© *Jane Gallacher*


Chris Badger © *Jane Gallacher*

In addition to our speakers, thanks must go to Jane Lawrance, for joining us even though Peter was recovering from surgery. Also, to Pippa Hayes, always a strong supporter, and to Carole Varndell in Malawi, who organised the Central Africana calendars. Finally, to Jessica Parkes and Liza Keoshgerian of The Royal Over Seas League for helping make our first event there a resounding success.

Lunch in Lincolnshire – Nyika on the Edge

On Saturday 7 June 2014, we will be holding a summer event, starting at mid-day, courtesy of Peter and Marianne Overton of Biosearch Expeditions. This will be an opportunity to catch up on our activities and enjoy a wonderful location with our trustees and fellow supporters. If you are interested in coming (the cost is £15 for an excellent lunch and all refreshments), please contact Peter Lawrance at sec.nvt@gmail.com. For more on the venue, go to: www.hilltopfarmholidays.co.uk. Very many thanks to Peter and Marianne Overton for hosting the event for us at their beautiful home.

Foot Educational Fund

Supporters will recall the Foot Educational Fund was established less than 18 months ago. Its aim is to fund local projects aimed at furthering environmental awareness among young Malawians, in particular the natural heritage of Nyika National Park and Vwaza Marsh Wildlife Reserve. In a short time, it has taken great strides! Here is the latest news ...

Primary schools environmental awareness project

Phase 2 of a project to sensitise school children in primary schools close to the Nyika National Park to environmental issues took place in November last year.

Charity Kumwenda, the Department of National Parks and Wildlife's Education and Extension Officer for the Northern Region, who is leading this project, reports nine schools are actively involved in the project.

Charity says the programme in each school started with constitution adoption by pupils, who then reviewed their action plans. Through doing this, the children are encouraged to take ownership of the project, rather than relying on their teachers to lead them. Charity and her team then introduced an environmental game, "Reserves and neighbours". The children competed to choose the right card to answer a series of environmental questions based on issues set out in a picture, they also discussed the environmental problems the picture presented and considered possible solutions. The children were then asked to identify environmental problems around their school and come up with possible solutions. Lastly, they turned their action plan into a vision of what their local school environment would look like five years from now. At this stage of the project, Charity reports:

> "*Kids and teachers were very happy. At first they thought the project would not continue – that we would start a program and end on the way. But now they have seen that it is a serious project and meaningful. We hope the seed we have planted will grow forever*."

Phase 3 of the project is now under way. We will report on how this phase is going in the next issue of Nyika-Vwaza News.

Mzuzu University Forestry Students Club study the occurrence of invasive species in Nyika National Park

Following a donation of £1340 from the Foot Educational Fund, participants from the Mzuzu University Forestry Students Club conducted a survey to determine the occurrence of invasive plant species around Chelinda in Nyika National

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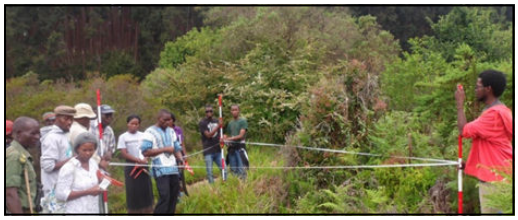
Park. In particular, they looked to establish the most abundant and frequent invasive species in the park and their distribution in upper lands and along riverine systems.


Survey team laying a quadrant using 3-4-5 method


Acacia mearnsii the most abundant invasive species

We now have a copy of the report the Club has produced, which is being added to the Bibliography on our website. UK trustee, Jonathan Timberlake has commended the thoroughness of the report and comments:

> *"It is interesting that wattle is actually as much a problem as pine. Indeed, in the long run wattle may turn out to be a greater problem … as (a) the seed bank lasts for a long time … and (b) once established wattles fix nitrogen thus increasing the fertility of the grasslands, which allows more common, coarse grasses to take over from the local species that are adapted to low-nutrient conditions. It is the low nutrient status of many of these montane grasslands that makes them so diverse and interesting."*

Without your support, the Foot Educational Fund would not exist and so projects like these would not be happening. We thank you for making them possible. If you would like to make a donation to the Fund or to any other aspect of our work, please contact Peter Lawrance (tel: 01483 714130; e-mail: sec.nvt@gmail.com; address: The Malt House, 50 Brewery Road, Horsell, Woking GU21 4NA). Thank you.

A UK trustee's Nyika photo diary

Paul Langton, a trustee of the UK Trust, reports on a short visit to Malawi at the end of 2013…

I visited Malawi in late November 2013 for one week on behalf of the NVT UK Trustees. The plan was to meet our new Manager, Sam Banda, and to attend the NVT Malawi Trustees' meeting on 23 November 2013.

Having travelled overnight from Heathrow, I arrived in Lilongwe well in advance of the meeting the following day, which was held at the Department of National Parks and Wildlife's offices. It was great to meet the Malawi Trustees and spend the day with them as they worked through a wide and varied agenda.

I headed up to the Nyika the following day with Sam to spend four nights with him, staying at the Manager's house. My main aim was to work through with Sam and Knox Mhango the cash flow forecasts and 2014 budgets.

Although only a short visit, we covered a significant number of issues. I also had an opportunity to see the work we are currently funding on the Nyika and to understand the challenges we face. I now have an even greater respect for our team – including our previous volunteer managers – than I had before my visit.

Here is a pictorial guide to my trip.


The vegetable garden at the Manager's house


Sam giving feedback from the Malawi Trustees' meeting to the Nyika team


The partially logged pine forest around Chelinda, a sobering sight

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Sam at Chosi viewpoint

Eland enjoying the plateau

Starting working on the 2nd duplex building

Work at the garage

Paul at Chosi viewpoint

Introducing Sam Banda, the Malawi Trust's first Malawian Manager, in his own words…

NVT has hitherto been spearheaded by different managers from various countries. Effective October 2013, Sam Banda was promoted from the post of Assistant Manager, Infrastructure on the World Bank-funded Trans-Frontier Conservation Area Project, a position he had held for a year within the auspices of NVT, to become the new Manager of the Nyika Vwaza Trust. He is the first Malawian to head the organisation since its formation in 2004. He took over from Britons Emma and Mike Rutter who have returned to their homeland after a six-month stint at the helm of NVT.

Sam Banda, NVT First Malawian Manager

Sam Banda, thirty-eight years of age, was born in Zimbabwe of a Malawian father and Zimbabwean mother among five other children. He is a father of three and is married to Joanna Madamombe. He has extensive experience in civil engineering harnessed from Zimbabwe, Mozambique, South Africa and fatherland Malawi, where he has worked for several entities consisting of a telecommunications giant, heavy duty construction companies, banks, project management firms as well as rural and urban councils. He is astute in buildings, road and dam constructions, water and sewer reticulation, engineering and real estate. He is a devoted conservationist.

He is well-motivated to move up organisational ladders and he is currently working towards an MSc in Business and Management. He enjoys reading engineering and business journals. "Chess, movies, music, basketball, cricket, volleyball and soccer", he says, "bring out the best cheer in me."

Sam continues: "As a lover of nature, Nyika and Vwaza are the best places in the world to be in direct touch with flora and fauna on a daily basis and to take over from great men and women from other parts of the world brings an aura of invincibility whilst at the same time is a humbling experience."

He goes on:

"My purpose is to continue to fly the flag of NVT as a highly focused and coherent organisation that strives towards improving the infrastructure of the national park and game reserve we operate in. Our intention is to bolster our fire-fighting capacity as the best in Africa, if not in the world, to ensure that the park road and bridge infrastructures are passable at all times without destroying the beautiful natural horizons, to clean up the environment and to assist researchers and volunteers in their various programmes that uplift Nyika and Vwaza as one of the best destinations in Africa and the world at large. It is also my intention to study and learn about the various species that roam and are established in our environments, tackle invasives that are springing up and enable NVT to have more impact in Vwaza by having another unit which operates from Kazuni."

Both in Malawi and in the UK, the trustees are delighted with Sam's appointment. His background for the role is about as good as it gets. With Sam leading the team, and working in close co-operation with the Department of National Parks and Wildlife and other stakeholders on the Nyika and in Vwaza, we will continue to strive to conserve these precious wilderness areas.

For this, though, we rely on your continued support. To make a donation, please contact Peter Lawrance (tel: 01483 714130; e-mail: sec.nvt@gmail.com; address: The Malt House, 50 Brewery Road, Horsell, Woking GU21 4NA). Thank you.

New checklist on reptiles and amphibians

A checklist of all reptile and amphibian species recorded from the Nyika National Park and immediate surrounds (both in Malawi and Zambia) and from Vwaza Marsh Wildlife Reserve has been compiled by Dr Donald Broadley of the Natural History Museum of Zimbabwe in Bulawayo, Zimbabwe. The checklist is available on our website www.nyika-vwaza-trust.org/Library/Reps.pdf. The checklist is arranged in zoological order by scientific name; common names are given in brackets. The notes indicate where the records are from. Endemic species (that is species only known from this area) are indicated by an **E** before the scientific name. We are very grateful to Dr. Broadley for producing this new checklist, which is a significant addition to the resources we have available on our website.

Readers' corner: Expatriate experience of Life and Work in Nyasaland Volume Two by Colin Baker

This, the second volume of 'Expatriate experience of Life and Work in Nyasaland', follows the pattern of its predecessor, being arranged on a broad thematic basis. Colin Baker asked contributors to tell not only about their own lives in Nyasaland but also what they remember or learned about their parents', and even grandparents', life and work in the country. Readers will find this a fascinating collection of reminiscences.

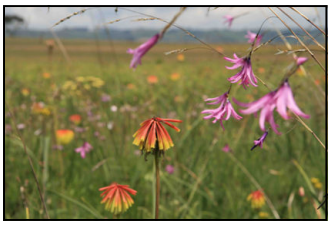
Soft back, 23.4 cm x 15.6 cms. 400 pp plus 44 pp of (88) photographs. Price £17.50 plus £3.00 p&p UK (£6.50 Europe; £11.00 Rest of World). Please make cheques payable to Colin Baker at 55a, Lon y Deri, Cardiff, CF14 6JP or contact cabaker@glam.ac.uk.

The Nyika's Tanzanian Twin: Kitulo Plateau National Park

Rosalind Salter is a freelance conservation ecologist with field research and project management experience predominately in the Eastern Arc and Coastal Forests Biodiversity Hotspots covering Kenya, Tanzania and Mozambique. She has worked in some of the most biologically interesting parts of Tanzania for some years. Rondi has compiled the first guide to the orchids and wild flowers of Kitulo National Park in Tanzania. Rondi visited Nyika for the first time in 2012/13 and had a chance to compare both places. Here are her observations…

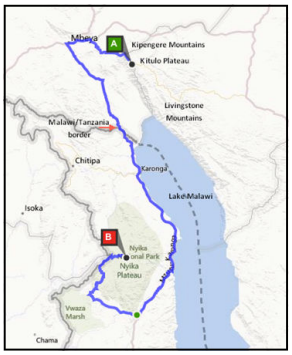
The Nyika Plateau of Northern Malawi and the Kitulo Plateau of the Southern Highlands of Tanzania share many special features. For anyone with a love of flowers and open mountain scenery you will feel instantly at home in these sweeping landscapes reminiscent of the Scottish highlands. But in these landscapes, familiarity is edged with that wonderful feeling of remoteness, solitude and rarity.

A National Park since 2006, Kitulo is the first African park to be gazetted for its floral diversity alone. Kitulo Plateau is referred to by the locals as 'Bustani ya Mungu' meaning the 'Garden of God' and known to botanists as the Serengeti of flowers. The charming and sleepy village of Matamba is the main gateway to the park. It is home to the friendly Wanji people and situated against the backdrop of Matamba ridge, which forms the striking northeast boundary of the park.



Kniphofia grantii and *Dierama pendulum* in November
© *Rosalind Salter*

View of Numbe valley taken from Matamba ridge
© *Rosalind Salter*



Location of Kitulo Plateau in relation to Nyika

From the western edge of Kitulo, Lake Malawi and the Nyika can be seen in the distance – so temptingly close. The main plateau is perched approximately 200 m higher than Nyika, at around 2,600m. The highest point is Mtori peak at 2961m; in Nyika it is Nganda Hill at 2607 m. Kitulo lies between the Kipengere and Livingstone Mountains, where on volcanic soils it supports the most important montane grassland community in Tanzania and is internationally regarded (along with Nyika) as an important centre of plant endemism. The geology of Nyika differs in that it is comprised primarily of granite, forming acidic soils. Overall, the higher altitude and fertile volcanic soil gives Kitulo the slight upper hand in floral diversity. Several species are common only to the Nyika and Kitulo (e.g *Aspidoglossum breve*) but others are restricted to either just Kitulo *Sclepias breviantherae* subsp. minor) or the Nyika (*Crassula nyikensis*).

Between November and April Kitulo hosts a breathtaking display of flowers. The jewel of Kitulo is the Numbe valley and in late November it becomes awash with millions of purple *Aster tansaniensis,* marking the start of the rainy season. Other commonly occurring but distinctive species found here include edelweiss look-alike *Alepidia peduncularis,* everlasting flower *Helichrysum herbaceum,* parrot-beaked *Gladiolus dalenii* and the elegant white *Delphinium leroyi*. Streams run along exposed basaltic dykes with unusual and attractive species found on the fringes including Sundew *Drosera madagascariensis*, the dainty yellow bulb *Xyris obscura*, an unusual heather *Erica whyteana* and the petite orchid *Cynorkis anacamptoides*.

From January, unmissable orchids include *Habenaria occlusa* and *Habenaria kyimbilae,* the green and white fragranced flowers of which resemble insects, along with the tall yellow *Satyrium sphaeranthum*, striking vermillion red and orange

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Disa stolzii and the pretty pink and white spotted *Disa ukingensis,* which litters the Matamba ridge. This spectacular rocky ridge forms the backbone of the park and supports numerous species of Impatiens, Proteas, Aloes and Ericas, as well as species such as the exquisite and range-restricted Iris *Moraea callista.* The ridge is also the favoured habitat of *Neocoenyra petersi,* a butterfly endemic to Kitulo; the Ukinga mountain skink *Mabuya brauni* and a few hardy mountain reedbuck *Redunca fulvorufula*.

Disa ukingensis – only known to Kitulo and Nyika plateaus
© *Rosalind Salter*

Moraea callista – only known to Kitulo and the Uluguru Mts. 100s can be seen on Matamba ridge in January
© *Rosalind Salter*

Habenaria occlusa – only known to Kitulo and Mbeya peak
© *Rosalind Salter*

From the edge of Kitulo plateau you get wonderful views over the Livingstone mountains, which also form part of the park. The Livingstone forests, dripping with lianas, lichens and epiphytic orchids, are home to the illusive Kipunji *Rungwecebus kipunji* – Africa's first new genus of primate in 83 years – which was first found by a team of local scientists in 2003. Endemic to southern Tanzania, the discovery of this primate highlights the importance of the Southern Highlands as an area of high biodiversity and endemism.

What you don't get on Kitulo are the herds of Roan antelope or Eland that are so commonly seen on the Nyika, but the bird life is wonderful. The plateau is recognised (as is Nyika) by BirdLife International as an Important Bird Area. Denham's bustard *Neotis denhami* is commonly seen stalking through beautiful blooms, including canary yellow iris *Moraea tanzanica* and the nodding heads of *Clematoptis uhehensis*. Buff-shouldered (previously and preferably named Mountain-Marsh) Widowbirds *Euplectes psammocromius* display their spectacular ribboned tails on red hot pokers *Kniphofia spp*. and giant lobelias *Lobelia mildbraedii* densely clustered in marshy areas, whilst flocks of Kipengere Seedeaters *Serinus melanochrous* fly between Afromontane African Redwoods *Hagenia abyssinica*. If you are very lucky a blue swallow *Hirundo atrocaerulea* may swoop overhead around Matamba ridge. Countless birds of prey can also be observed soaring gracefully overhead, such as African marsh harrier *Circus ranivorus*, Pallid harrier *Circus macrourus* and Augur buzzard *Buteo augur,* whose white belly can often be easily spotted on isolated trees.

Challenges

Southern Tanzania and Northern Malawi cover the Ecoregion 'Southern Rift Montane Forest-Grassland Mosaic'. As Nyika and Kitulo are the only protected areas covering this exceptional montane habitat, it is essential that protection and conservation management is effective.

The distinct biodiversity of these highland areas is unfortunately threatened due to a rapidly increasing human population, illegal logging, animal poaching and the harvesting of orchid tubers, known as Chikanda - a delicacy in Zambia and Malawi.

The high demand for Chikanda was first highlighted in Tanzania just over a decade ago (Davenport & Ndangalasi, 2003). However, since then, sadly little progress has been made to curb the trade and it continues unchecked and is now seemingly out of control. Elevated financial rewards due to the increasing scarcity of orchid tubers has exacerbated the problem, as rural communities find it a quick way to supplement their family income.

The trade in Chikanda is illegal. Orchids are listed in Appendix II of the Convention of International Trade in endangered Species (CITES) and therefore the uncertified passage of material over international borders is prohibited. The main species under threat come from the genera *Habenaria, Satyrium* and *Disa*. Currently, there are no really effective mechanisms to halt this trade.

Field observations

The Southern Highlands Conservation Project (SHCP)[1] has been conducting habitat monitoring surveys for the last two years (February 2012 and 2013) in Kitulo National Park. Through these surveys it has been observed that the level of harvesting has increased dramatically over the last year. In February 2012 no evidence of harvesting was observed along transects; however, in February 2013, three out of the five transects showed signs of harvesting.

In one area, which is a key attraction to visitors due to the presence of gorgeous swathes of orchids and irises, as well as a key location of the Denham's Bustard, over 100 holes were discovered. Further diggings were observed along key tracks and paths cutting through the park.

Hole of harvested orchid tuber (2013)
© *Rosalind Salter*

Over the border in Nyika, a worrying escalation in the level of harvesting is also being observed (*P. Simkoko*, *pers comm*, December 2012). Species targeted include the spectacular *Disa ro-*

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[1] Field work conducted by Rosalind Salter BSc MSc MCIEEM, administered by the Wildlife Conservation Society (WCS).

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busta (Leedal, 1982), confined to Tanzania, Malawi and Zambia and *Disa ukingensis,* which is only known to these two plateaus. In Nyika *Disa satyriopsis* is the most commonly collected species and numbers are seemingly now so low there are concerns that the population is no longer viable (*P. Simkoko*[2], *pers comm*, December 2012). In five years of visiting Kitulo only two specimens of *D. satyriopsis* have been observed (*R. Salter*, *pers comm* 2013) – is this species also under threat here?

It is still not known exactly how many species are under threat from the trade but it could be as many as 85 species (Davenport & Ndangalasi, 2002) covering Southern Tanzania and Northern parts of Malawi and Zambia. The disappearance of several targeted terrestrial edible orchid species, notably *Disa spp*., in Zambia (Bingham, 2004) is now meaning immense pressure is being placed on the highland areas of Malawi and Tanzania to meet demand. Arguably the highest concentrations of these remaining orchids are found in protected areas such as Kitulo and Nyika National Parks and so the escalation of illegal harvesting in these areas is inevitable.

Research and law enforcement need to be (and are being) increased in both areas. It is hoped that exchange visits between the two parks and future projects on both sides of the border will encourage this. The Nyika and Kitulo only have each other to learn from and time is of the essence. The in-situ value of orchids, rather than extraction value, needs to be promoted and harnessed, and arguably one of the best ways of doing this is through eco-tourism.

Fancy a visit to Kitulo?

Nyika is more advanced than Kitulo in terms of infrastructure and is well set up for tourists. Since Kitulo was gazetted as a National Park progress has been slow to improve infrastructure for tourism. However the guesthouses in the neighbouring Matamba village are clean and welcoming. If you have your own equipment and supplies you can also camp in a superb setting overlooking the Matamba Ridge. It is, however, hoped that a new project 'Strengthening the Protected Area Network of Southern Tanzania' (SPANEST)[3] will help improve infrastructure in the park over the next few years and therefore entice more visitors to visit this wonderful place.

Currently few people visit the park, so if you do make the effort you will most likely have the place to yourself. It therefore presents a unique opportunity for the traveller who seeks something a bit different. The only UK based tour company currently covering this area is run by the natural history tour operators, Greentours. If you are interested, information can be found on their website—www.greentours.co.uk .

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http://www.wcstanzania.org/shcp.htm.

Many thanks to Rondi for such an evocative account of these Serengeti's of flowers. Both the Nyika and Kitulo are under threat for similar reasons and we are hoping to learn from one another's management strategies. To support this work, please do make a donation, if you can. Contact Peter Lawrance (tel: 01483 714130; e-mail: sec.nvt@gmail.com; address: The Malt House, 50 Brewery Road, Horsell, Woking GU21 4NA).

[2] Patson Simkoko has been an officer for Dept National Parks & Wildlife (DNPW) at Chelinda Camp in Nyika National Park, Malawi for 10 years.

[3] SPANEST http://www.facebook.com/southerncircuitproject

To make a donation now please go to www.nyika-vwaza-trust.org and click on the Donate Now button shown above.

The mammals of the Nyika - Vwaza

David Happold is a zoologist who has worked on African mammals for about 50 years; he has held academic posts at the University of Khartoum (Sudan), University of Ibadan (Nigeria), and Chancellor College. His speciality is the biology of small mammals, and he was the editor (with his wife Meredith) of the small mammal volumes in Mammals of Africa published in 2013. His favourite occupations are doing fieldwork and writing papers and books on African mammals. He is one of our Trust's Patrona Naturae.

A brief history of mammalian studies

Scientific studies of mammals on the Nyika began when Alexander Whyte, then Naturalist to the Protectorate of British Central Africa, visited Nyika in June and July 1896 (Thomas 1897a,b). Whyte was a prodigious and indefatigable collector, especially when one considers how remote the Nyika was in those days. Most of his specimens were small mammals and were collected at 6,000 to 7,000 ft (1830 - 2130 m); they included species that are confined to the grasslands of the plateau as well as some typical of the surrounding woodlands. Whyte's specimens were sent to the British Museum of Natural History in London, as were most specimens from Africa in the early colonial days; here they were identified and the results were published by Oldfield Thomas in 1897. These specimens are still available for study by mammalogists.

Roan antelope *Hippotragus equinus*
© Mike Budgen

In the early years of the 20th century, several travellers visited the Nyika and subsequently wrote about their observations. In 1903, J. McClounie was the first to record Zebra, Common Warthog, Klipspringer, Roan Antelope, Bushbuck, Southern Reedbuck and Buffalo. In about 1913, W. P. Young recorded that "we had one of the most glorious weeks of our lives! There were Eland, Roan and Zebra in some numbers and the stalking .... was fascinating!" Young also recorded that his porters hunted hyraxes above the Henga valley, and that in one Poka village there was a large lion skin pegged out to dry.

No further studies were undertaken until the 1950s. At this time, the plateau became more accessible because the Colonial Development Corporation established pine plantations at Chelinda, and roads enabled access to previously inaccessible parts of the plateau. Three other events were significant to the development of the Nyika: the plateau was formally declared a National Park in 1965 and this gave protection to the flora, fauna and ecosystems, secondly the park was enlarged in 1978 to include the escarpments and the northern hills, and thirdly the park became part of the Trans Frontier Conservation in 2004 so that it is now linked with adjoining protected areas in Zambia. As a result, the park gained many ecosystems at lower altitudes all around the plateau and hence the diversity and species numbers of flora and fauna has been enhanced. Several important studies were undertaken in the 1950s to 1980s, all of which increased our knowledge of the mammals: most notable are the works of Lawrence & Loveridge (1953), Hanney (1962, 1965), and Ansell & Ansell (1953) for the Zambian Nyika. Elias (1981) provided the first full checklist of the mammals of Nyika, and Ansell & Dowsett (1988) wrote the definitive work on the taxonomy and distribution of the mammals of Malawi which is also a valuable source of information on the Nyika. The small mammals have been mostly neglected over the years until recent studies by Hanney (1962, 1965), Overton & Nursaw (1972), Happold & Happold (1989), Happold *et al* (1987; bats only) and Chitaukali *et al* (2001). Two important books provide information on Nyika and its mammals: *Malawi: Wildlife Parks and Reserves* by Carter (1987) has one chapter on Nyika National Park, and *A Visitors Guide to Nyika National Park, Malawi* by Johnson (1990) is undoubtedly the most detailed and gives a lot of ecological data on the larger mammals (and much else).

The Mammals of Nyika National Park

Long-tailed Pouched Rat
Beamys hindei
© David Happold

Table 1 lists the 99 species of mammals currently recognized and known to occur and to be resident in the park. Table 1 does not give any indication of the abundance of each species - it just records that the species is present. The species are listed taxonomically by order, but each order is not divided into families. For each species the data is provided in five columns. For each, the current scientific name (genus, species), and the vernacular (common) name is given in the first two columns. These names are those used in the six volumes of *Mammals of Africa* (Kingdon *et al* 2013). The third column provides the authority for the presence of each species in Nyika National Park; each authority is given a number (with the number code detailed in the caption). Not every authority is given, because more recent lists were simply compiled from previous works; instead, only the earliest records are listed. For some species, only a single authority is given, suggesting that the species is either rare, rarely seen, or has a limited geographical distribution in the park. Conversely, species with many authorities tend to be those which are commoner and more easily seen. A number of records are based on the maps in Ansell & Dowsett (1988), even though Nyika and Vwaza are not referred to specifically in the text. The fourth column is headed 'Former taxonomic name' which, if appropriate, gives the former name or names of the species. One problem during the compilation of this list is that the name of some species has altered over the years because of changes in taxonomy, and new information (especially with respect to genetics and biochemistry) on the relationship of the species to other species. For example, the Least Spiny Mouse *Acomys spinosissimus* has been referred to as *Acomys selousi* or *A. cahirinus* in the older literature; it is not that there are three species of Spiny Mice but that the single species has been called by other names. Another example is Whyte's Mole-rat; it was originally described as *Georhychus whytei*, then it was considered as a subspecies of the widespread South Africa *Cryptomys hottentotus* and the name *whytei* was reduced to subspecific rank; later still the name *whytei* was restored to specific rank, and later still, new taxonomic work

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considered that the genus *Cryptomys* should be confined to mole-rats south of the Zambezi River and that all species north of the river should be placed in a new genus *Fukomys*. Hence Whyte's Mole Rat is now *Fukomys whytei* (Burda *et al*. 2005). All this is rather complicated and confusing and should not concern the lay-reader; however, it is important to realise that any particular species may have had different names in the past. These situations are more widespread amongst smaller mammals than larger mammals.

The fifth column provides a very general assessment of where species are found in the park. Many species might be classified as occurring on both the plateau and the lower woodlands, especially where these two major ecological zones join.

There are a number of species which have been recorded on a only few occasions; these may be considered as vagrants or migrants and not resident members of the mammalian fauna of Nyika National Park. Hence it is difficult to know whether to place these species in Table 1 or Table 2 (see Table 2a).

The Mammals of Vwaza Marsh Wildlife Reserve

The last column of Table 1 lists the species recorded in Vwaza Marsh Wildlife Reserve. The mammals of Vwaza have been much less studied and catalogued than those of Nyika. The only definitive work is that of McShane & McShane-Caluzi (1988). For the mammals, most of the listed species are large and/or easily seen. Apart from the squirrels, Cane Rat, Porcupine, Whyte's Mole-Rat and one species of mouse, no other species of rodents are given, nor any bats and shrews. Other information can be derived from the maps in Ansell & Dowsett (1988), but in general small mammals have never been surveyed properly in Vwaza Marsh. A total of 47 species are listed here. It is probable that a further 30 -40 small species await discovery. For Vwaza Marsh Wildlife Reserve two species, Black Rhinoceros and Wildebeest, are listed in Table 2(b).

Species removed from the mammalian fauna of Nyika National Park and Vwaza Marsh Wildlife Reserve

Table 2 lists species which have been recorded from the parks at one time, but are not considered now be part of the fauna. The first three species (Table 2a) - recorded in the past but with no recent sightings - might be considered as part of the fauna even now; however these species were never common, were probably vagrants, and have not been seen for many years. The other species, listed under 2(b), are not accepted for various reasons. More information is required about each of these species, and specimens need to be fully documented and verified. Some are probably misidentifications. It may well be that some of these species do occur with the parks, but more substantial evidence is required.

A biogeographical note

Four-striped Grass Mouse
Rhabdomys pumilio
© David Happold

The many varied habitats in Nyika National Park, and its large size, result in a rich diversity of mammalian species, some 55% of the total recorded in Malawi. (The total number of mammals in Malawi is about 187 [Ansell & Dowsett 1988].) Nearly all the species in the parks are widespread in Malawi and in neighbouring countries where there is the appropriate habitat. Special species confined to the plateau include Four-striped Grass Mouse *Rhabdomys pumilio* (confined to Nyika and Mt Mulanje in Malawi) and Gnoske's Mouse Shrew *Myosorex gnoskei* (endemic to Nyika), as well as many species of smaller mammals which, in Malawi, occur only in highland areas (e.g. on Nyika, Vipya, Zomba Plateau and Mt Mulanje). In contrast to birds (Benson 1953, Johnson 1990, Dowsett-Lemaire & Dowsett 2006) and orchids (La Croix et al. 1991, Johnson 1990) there are fewer special species of mammals on the Nyika Plateau than there are for species of birds and orchids. Nonetheless, this does not detract from the importance of Nyika as a major conservation area in Malawi for mammals.

Changes to the mammalian fauna of Nyika over time

The number of species and the sizes of populations depends on many environmental factors, and has undoubtedly changed over time. The major factors are (a) the extent of plateau grasslands and evergreen forests over the millennia, (b) the role of fire in determining the presence and extent of evergreen forests, and (c) the influence of humans as a result of habitat destruction, poaching and hunting.

Delicate Soft-furred Mouse
Praomys delectorum
© David Happold

There are differing views on whether the plateau was once all evergreen forest, or all grasslands, or a mixture of both. During pluvial periods in the past, it is suggested that the forests moved to higher altitudes replacing the grasslands and hence the plateau was then covered by evergreen forests. During glacial periods, the forests retreated to lower altitudes and grasslands were much more extensive and perhaps joined up with grasslands on other highland areas. The evidence from studies of small mammals suggests that there were always both evergreen forests and grasslands, each varying in size and extent as pluvial and glacial periods alternated over time. For example, the Four-striped Grass Mouse *Rhabdomys pumilio* is only found in high altitude grasslands (and never in evergreen forests). If the plateau had, at one time, supported only evergreen forests during a pluvial period, this species would have become locally extinct; when grasslands were re-established during cooler and drier periods, individuals of *R. pumilio* could not have reached the new grasslands because of the surrounding forests. The same line of argument can be used for the Delicate Soft-furred Mouse *Praomys delectorum* which is found only in evergreen forests (such as the Juniper Forest), never in grasslands although sometimes, rarely, in bracken on the edges of forests. The presence of both these species strongly suggests that both grasslands and evergreen forests have always been present on the Nyika Plateau (see, e.g. Happold & Happold 1989).

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Dusk Pipistrelle
Pipistrellus hesperidus
© David Happold

The role of fire in shaping the present landscape is also controversial. Whether the fire is started by lightning strikes or human activities, it promotes grasslands and shrublands and destroys forests. Certainly, it is well known that fire can alter the composition of herbs and grasses, depending on the frequency and intensity of the fire (Lemon 1968) and this may alter the favourability of the grasslands to mammals (whether for food or cover). Most mammals that live in the plateau grasslands adapt to fire; the larger ones can move away and then return as the grasses shoot again; small species can retreat into burrows and survive the fire; however, shortage of food after fire may cause higher mortality during the weeks immediately after the fire but later new shoots provide highly nutritious food. Many species of small mammals in grasslands are very adaptable and change their diet as the seasons change. (Fire is also highly destructive to many insects that provide food for insectivorous mammals and birds). Small mammals that live in evergreen forests are much less adaptable. Fire is probably one of the factors that has reduced the extent of evergreen forests (and the diversity of species and population numbers of species dependent on these forests). A balanced approach to the extent and frequency of fires, and the protection of montane evergreen forests, is essential.

Hunting and poaching reduce population numbers. Hunting and poaching still occur in the Nyika National Park, although good management control appears to have stabilized the situation more recently (see below).

Species composition and population numbers of mammals

Surveys have assessed the population numbers and locations of some of the larger and easily visible species. For example, most Reedbuck, Eland, Roan Antelope and Zebra are found on the 'Northern Hills', and 'Plateau'; in contrast Bushbuck are found mostly on the 'Northern Hills' and 'Southern Hills', and Warthog are found almost with equal frequency in all three locations (Munthali & Banda 1992). For these same species, aerial surveys have provided estimates of the total population, e.g. Reedbuck, ca 5200; Eland, ca 3500, and Zebra, ca 500 (Munthali and Banda 1992). These estimates vary over time: surveys in 1975, 1978 and 1989 show that the numbers of Reedbuck and Eland had increased during this 14-year period, but the numbers of Roan and Zebra had remained almost constant. However, as at 2010, the population numbers of larger more visible species on the plateau may have increased over the previous decade, as shown by the Relative Abundance Surveys carried out by the long series of observations conducted by the Biosearch Expeditions between 1997 and 2010 (P. Overton *in litt* 2014).

Common Eland *Taurotragus oryx*
© Sue Cheyne

There is virtually no data for small mammals other than in the grasslands: near Chelinda, in May 1985, the density in two separate study areas was ca 21 individuals/ha (4 spp.) and 26 individuals/ha (5 spp.) (Happold & Happold 1989). Stewart (1972) showed that unburned grassland on the plateau supported fewer individual small mammals than did grasslands that were burnt annually and biennially, and that unburned "bracken-sedge" supported more small mammals than any of the grasslands.

In Vwaza Marsh Wildlife Reserve, there have also been changes in species composition: for example Black Rhinoceros are now locally extinct (due to poaching), Puku and Waterbuck emigrated into the Wildlife Reserve in the 1980s from the Luangwa Valley in Zambia, and African Wild Dogs are recorded more regularly now than in the past (T. McShane, *in litt.* 2014). The establishment of the Trans Frontier Conservation Area provides additional protection along the western side of Vwaza Marsh Wildlife Reserve; this has the potential to increase the population numbers of some species already established in the Wildlife Reserve and to allow additional species, not yet recorded, to enter the Wildlife Reserve from Zambia.

A Final Note

Nyika National Park contains a magnificent diversity of mammals - nearly half the total number of species known in the whole of Malawi; this is due, in part, to its large size and many varied habitats. It provides a very welcome and important conservation area especially now that so many habitats outside conservation areas are highly modified by human activities. Lots of work needs to be accomplished to ensure that the mammals of Nyika survive into the future: regular monitoring of numbers and habitats, fire and poaching control, maintenance of diversity of habitats, and investigations into the ecology of individual species and communities, to name a few. The same is equally true for Vwaza Marsh Wildlife Reserve. Collectively they form the most important terrestrial conservation area in Malawi.

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Grey-bellied Pygmy Mouse
Mus triton
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Nyika African Climbing Mouse
Denromus nyikae
© David Happold

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Table 1.
The mammals of Nyika National Park and Vwaza Marsh Wildlife Reserve.
The scientific names and vernacular names are those used in Mammals of Africa (2013). Abbreviations for references: 1 = Ansell 1978. 2 = Ansell & Ansell 1953. 3 = Ansell & Dowsett 1988. 4 = Bergmans & Jachmann 1983. 5 = Carter 1987. 6 = Cater 1954. 7 = Chirwa 1995. 8 = Chitaukali *et al* 2001. 9 = Critchlow 2004. 10 = Critchlow & Foot 1996. 11 = Critchlow *et al*. 1995. 12 = Critchlow & Kumwenda 1995. 13 = Elias 1981. 14 = Hanney 1962. 15 = Hanney 1964. 16 = Hanney 1965. 17 = Happold & Happold 1989. 18 = Happold *et al.* 1987. 19 = Hough 1989. 20 = Ingles 1965. 21 = Johnson 1990. 22 = Kock *et al* 1998. 23 = Lawrence & Loveridge 1953. 24 = McClounie 1903. 25 = McShane & McShane-Caluzi 1988. 26 = Mitchell *et al* 1953. 27 = Overton & Nursaw 1972 28 = Peterhans *et al.* 2008. 29 = Thomas 1987a. 30 = Thomas 1897b. 31 = Tweddle 1995. 32 = Young 1953. 33 = Zimmerman 1968. Other abbreviations: Z = Zambian Nyika. P = Nyika Plateau. L = Woodlands on lower slopes in Nyika N.P. E = evergreen forest. C = Commensal. R = Rocks and rocky habitats. S = Swampy areas, dambos. A = Aquatic habitats. V = Vwaza Marsh Wildlife Reserve. ? = Uncertain or dubious record. For species recorded in Vwaza only, and not in Nyika, comments on habitat are not given.

Scientific Name	Vernacular Name	Nyika NP (References)	Former taxonomic name(s)	Notes (Nyika only)	Vwaza Marsh WR (all 25)
MACROSCELIDIDEA					
Elephantulus brachyrhynchus	Short-snouted Sengi	27, 3, 13			V
Petrodromus tetradactylus	Four-toed Sengi	3, 13			V
Rhynchocyon cirnei	Chequered Giant Sengi	3, 13, 23		L	
HYRACOIDEA					
Heterohyrax brucei	Bush Hyrax	32, 3, 21	*Dendrohyrax brucei*	R, P, L	V
Dendrohyrax arboreus	Southern Tree Hyrax	6, 13, 21		E	
TUBULIDENTATA					
Orycteropus afer	Aardvark	33, (13), (21)		L	V
PROBOSCIDEA					
Loxodonta africana	African Elephant	3, 21,		P, L	V
PRIMATES					
Otolemur crassicaudatus	Long-eared Greater Galago	(21)		L	V
Cercopithecus pygerythrus	Vervet Monkey	3, 21, 5		L	V
Cercopithecus mitis	Blue Monkey	6, 21, 5, 23	*C. albogularis*	L, E	
Papio cynocephalus	Yellow Baboon	13, 21, 5	*P. ursinus*	L	V
Galago moholi	Southern Lesser Galago	(21), 3	*G. senegalensis*	L	V
RODENTIA					
Heliosciurus mutabilis	Mutable Sun Squirrel	30, 2, 1	*Heliosciurus rufobrachium mutabilis*	?P, L, Z	
Paraxerus cepapi	Smith's Bush Squirrel	21		L	V
Paraxerus lucifer	Black-and-red Bush Squirrel	14, 13, 3		E, Z	
Graphiurus murinus	African Forest Dormouse	30 , 2, 14, 13		Z	
Graphiurus microtis	Noak's African Dormouse	3, 8		P, L	
Tatera boehmi	Boehm's Gerbil	14, 16, 13, 3	*T. böhmi*	L	
Beamys hindei	Long-tailed Pouched Rat	14, 8, 1	*B. major*	E	
Cricetomys gambianus	Giant Pouched Rat	14, 16, 3		C, L	
Saccostomus campestris	Cape Pouched Rat	8		L	
Lophuromys flavopunctatus	Yellow-spotted Brush-furred Rat	30, 23, 27, 14, 15, 16, 18, 8	*L. aquilus*	E, P	
Acomys spinosissimus	Least Spiny Mouse	30, 14, 8	*A. selousi; A. cahirinus*	L	V
Aethomys chrysophilus	Red Veld Rat	30, 14, 8	*Mus chrysophilus*	L	
Aethomys nyikae	Nyika Veld Rat	29 27, 8	*Mus nyikae*	P, L	
Mus triton	Grey-bellied Pygmy Mouse	23, 27, 14, 16, 17, 8		P	

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Table 1.
The mammals of Nyika National Park and Vwaza Marsh Wildlife Reserve (continued).

Scientific Name	Vernacular Name	Nyika NP (References)	Former taxonomic name(s)	Notes (Nyika only)	Vwaza Marsh WR (all 25)
Dendromus nyikae	Nyika African Climbing Mouse	23, 14, 16, 8	*Dendromus mesomelas nyikae*	P, Z	
Dendromus melanotis	Grey African Climbing Mouse	27, 2, 3		?L, Z	
Dendromus mesomelas	Brants's African Climbing Mouse	30, 1,16, 3	*Dendromus mesomelas nyasae; Dendromus nyasae*	P, Z	
Dendromus mystacalis	Chesnut African Climbing Mouse	14, 2, (3)	*Dendromus mysticalis whytei*	P, Z	
Dasymys incomtus	Common Shaggy Rat	2, 14, 16, 3	*D. incomptus; D. kaiseri*	P, L, S, Z	
Lemniscomys rosalia	Single-striped Grass Mouse	30, 14, 16	*Lemniscomys griselda; Arvicanthis dorsalis*	L	
Rhabdomys pumilio	Four-striped Grass Mouse	23, 27, 14, 16, 18, 8		P	
Grammomys ibeanus	East African Thicket Rat	3, 14, 16 18, 8	*Thamnomys cometes*	L	
Grammomys dolichurus	Woodland Thicket Rat	14, 17	*Mus arborareus; Thamnomys cometes (?)*	P, L	
Praomys delectorum	Delicate Soft-furred Mouse	27, 14, 16, 17	*P. jacksoni delectorum*	E, P	
Mastomys natalensis	Natal Multimammate Rat	14, 16, 8		L, Z	
Pelomys fallax	East African Creek Rat	14, 16, 3	*Golunda fallax*	L, S	
Rattus rattus	Black Rat	14, 8		C	
Zelotomys hildegardeae	Hildegarde's Broad-headed Mouse	2, 14, 16, 8, 3		P, L, Z	
Otomys angoniensis	Angoni Vlei Rat	23, 2, 14, 16	*O. irrorates angoniensis; O. irroratus; O. angoniensis nyikae*	S, P, Z	
Otomys denti	Dent's Vlei Rat	23, 27, 1, 14, 16	*O. kempi*	S, P, Z	
Otomys typus	Ethiopian Vlei Rat	23, 14, 1	*O. uzunwensis; O. typus uzungwensis; O. percivali*	S, P, Z	
Heliophobius argenteocinereus	Silvery Mole-rat	23, 2, 3, 14		P, L, Z	
Fukomys whytei	Whyte's Mole-rat	2, 14, 8	*Georychus whytei; Cryptomys hottentotus whytei; Cryptomys whytei*	L, Z	V
*Thryonomys gregorianus (*note 1*)*	Lesser Cane Rat	30, 14, 2, 3	*T. sclateri*	L	V
Hystrix austraeaustralis	Cape Crested Porcupine	20, 8, 5, 21		P, L	V
LAGOMORPHA					
Lepus victoriae	African Savanna Hare	3, 21	*L. saxatalis*	P, L	V
Pronolagus rupestris	Red Rock Hare	30?, 2, 3, 21	*Lepus crassicaudatus*	R	V
SORICOMORPHA					
Crocidura olivieri	African Giant Shrew	2, 20	*C. flavescens; C. occidentalis*	P, Z	
Crocidura luna	Moonshine Shrew	23, 2, 20, 3	*C. fumosa johnstoni*	P, Z	
Crocidura hildegardeae	Hildegarde's Shrew	23, 1, 3	*C. silaceae hildegardeae*	P, Z	
Crocidura nigrofusca	African Black Shrew	1, 3	*C. zaodon*	Z	
Suncus lixus	Greater Dwarf Shrew	30, 3	*Crocidura lixa*	L	
Suncus varilla	Lesser Dwarf Shrew	23		L	
Myosorex gnoskei	Gnoske's Mouse Shrew	28		P	
CHIROPTERA					
Eidolon helvum	African Straw-coloured Fruit Bat	2, 3		Z, E	
Epomophorus crypturus	Peters's Epauletted Fruit Bat	2, 3		Z	
Epomophorus wahlbergi	Wahlberg's Epauletted Fruit Bat	2, 3		Z	
Plerotes anchietae	Anchieta's Broad-faced Fruit Bat	22		L	
Rhinolophus clivosus	Geoffroy's Horseshoe Bat	2,3, 18		Z, E	
Rhinolophus blasii	Blasius's Horseshoe Bat	2, 3, 18		Z, E	
Rhinolophus hildebrandti	Hildebrandt's Horseshoe Bat	2, 3		Z	

Note 1: or *T. swinderianus*

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Table 1.
The mammals of Nyika National Park and Vwaza Marsh Wildlife Reserve (continued).

Scientific Name	Vernacular Name	Nyika NP (References)	Former taxonomic name(s)	Notes (Nyika only)	Vwaza Marsh WR (all 25)
Miniopterus natalensis	Natal Long-fingered Bat	1, 3	*M. schreibersi*	Z	
Pipistrellus hesperidus	Dusk Pipistrelle	3, 18	*P. kuhli*	P	
Tadarida ventralis	Giant Free-tailed Bat	3		Z	
CARNIVORA					
Canis adustus	Side-striped Jackal	6, 23, 2, 21, 5		P, L	V
Lycaon pictus	African Wild Dog	6, 3, 7		L	V
Aonyx capensis	African Clawless Otter	3, 21		L, A	V
Atilax paludinosus	Marsh Mongoose				V
Mellivora capensis	Ratel	5, 3, 21, 11			V
Poecigale albinucha (note 2)	African Striped Weasel	3, 21, 12		P, Z	
Nandinia binotata	Two-spotted Palm Civet	2, 3, 21		E	
Civetticus civetta	African Civet	3, 21, 5	*Viverra civetta*	Z, L	V
Bdeogale crassicaudata	Bushy-tailed Mongoose	3, 21		P	
Ichneumia albicauda	White-tailed Mongoose				V
Herpestes ichneumon	Egyptian Mongoose	21		S, (P), (L)	
Herpestes sanguineus	Slender Mongoose	3, 21	*Galerella sanguinea*		V
Helogale parvula	Dwarf Mongoose	2, 3, 21		L	V
Mungos mungo	Banded Mongoose				V
Crocuta crocuta	Spotted Hyaena	6, 2, 3, 21		P	V
Felis lybica (note 3)	Wild Cat	31		P	V
Leptailurus serval	Serval	6, 2, 3, 21	*Felis serval*	P, L	V
Panthera pardus	Leopard	26, 6, 2, 3, 21		P	V
Panthera leo	Lion	26, 32, 6, 3, 21		L, (P)	V
PERISSODACTYLA					
Equus quagga	Zebra	24, 23, 26, 6, 32, 21	*E. zebra; E . burchellii*	P	V
ARTIODACTYLA					
Potamochoerus larvatus	Bushpig	19 , 6, 3	*P. porcus*	L, E	V
Phacochoerus africanus	Common Warthog	24, 6, 19, 3, 21	*P. aethiopicus*	L	V
Hippopotamus amphibius	Hippopotamus	5, 3, 21		L, A	V
Alcelaphus buselaphus	Hartebeest	6, 26, 21	*A. lichtensteinii*	L	V
Cephalophus harveyi	Harvey's Duiker	23, 26, 6, 21	*C. natalensis*	P, E	
Philatomba monticola	Blue Duiker	26, 6, 3, 21	*Cephalophus monticola*	E	
Sylvicapra grimmia	Common Duiker	23, 26, 6, 3, 21		P, L	V
Oreotragus oreotragus	Klipspringer	24, 26, 6, 3, 21		P, R	V
Raphicerus sharpei	Sharpe's Grysbok	3, 21		L	V
Hippotragus equinus	Roan Antelope	24, 32, 26, 6, 3, 21		P	V
Tragelaphus strepsiceros	Greater Kudu	6, 3, 21		L	V
Tragelaphus scriptus	Bushbuck	24, 26, 6, 21		P, L	V
Taurotragus oryx	Common Eland	32, 23, 6, 26, 3, 21		P	V
Aepyceros melampus	Impala				V
Kobus ellipsiprymnus	Waterbuck				V
Kobus vardoni	Puku	6, 3, 21		P, L	V
Redunca arundinum	Southern Reedbuck	24, 26, 6, 3, 21		P	
Syncerus caffer	Buffalo	24, 26, 6, 21		L	V

Note 2: one record on Nyika (Critchlow & Kumwenda 1995)
Note 3: one record on Nyika (Tweddle 1995)

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Table 2.
Species considered not to be part of the mammalian fauna of Nyika National Park and Vwaza Marsh Wildlife Reserve because (a) record is old with no recent sightings or (b) evidence for record is inadequate and needs verification, or locality is not within the park. Reference numbers as for Table 1. Parentheses = record probable or uncertain.

Scientific name	Vernacular name	Reference	Notes
(**a) Record is old with no recent sightings**			
Acinonys jubatus	Cheetah	26, 3, 21	Recorded as 'fairly plentiful'on Nyika Plateau by 26; record dubious and ambiguous; no recent sightings (3)
Diceros bicornis	Black Rhinoceros	24, 3	Recorded in foothills long ago (21). Locally extinct. Recorded many years ago as vagrant in Vwaza Marsh WR (25).
Connochaetes taurinus cooksoni	Wildebeest	25	This subspecies occurs in NW Zambia. A few vagrants in Vwaza Marsh WR in 1945 or 1946
(b) Evidence for record is inadequate and needs verification, or locality is not within the park			
Heliosciurus gambianus	Gambian Sun Squirrel	25	Species is confined to West and Central Africa. Not known from Malawi. Probable misidentification.
Dendromus mystacalis	Chestnut African Climbing Mouse	14, 2, (3)	'Believed to be absent from higher altitudes' (3). Listed by 9 but no verified specimens.
Mus minutoides	Tiny Pygmy Mouse	27, 9	Several records but need verification
Mylomys dybowskii	Dybowski's Mill Rat	8	Recorded as first record for Malawi. No details, locality or specimen number given. Mostly West African but with single localities in Tanzania and in Kenya.
Tatera leucogaster	Bushveld Gerbil	10	Sight record. No specimen for verification.
Otomys tropicalis	Tropical Vlei Rat	See note	One questionable record from Nyika Plateau
Steatomys pratensis	Common Fat Mouse	8	Recorded from Chipome Valley (*Brachystegia* woodland, 1530m). No details or specimen number given.
Crocidura fuscomurina	Bicoloured Shrew	3	Recorded from Livingstonia by 3; may occur in Nyika NP.
Crocidura hirta	Lesser Red Shrew	8	"New for the Nyika Plateau" (8). No details or specimen number given.
Epomops dobsoni	Dobson's Epaulleted Fruit Bat	8	Recorded from Chipome Valley (*Brachystegia* woodland, 1530m). No details or specimen number given.
Rhinolophus ?simulator	Bushveld Horseshoe Bat	2	Zambian Nyika. Dubious record, only one specimen; not recorded on Nyika by 3.
Myotis welwitschi	Welwitsch's Myotis	2	Zambian Nyika. Not recorded for Nyika by 3 and 13. Recorded at Livingstonia by 3.
Tadarida fulminans	Madagascan Free-tailed Bat	9	Recorded from Chelinda.. No specimen for verification. Not known from Malawi; probably misidentification.
*Genetta maculata (*as *Genetta rubiginosa)*	Rusty-spotted Genet	3 (21)	Dead specimen near Domwe (3) " ... believed absent from the montane grasslands and forest" (3)
*Caracal caracal (*as *Felis caracal)*	Caracal	5, 21	Although recorded by 5 and 21, 3 shows that the old record for Nyika is incorrect.
Hippotragus niger	Sable Antelope	26, 25	Although recorded from *Brachystegia* and mopane woodlands (26) surrounding Nyika, not recorded for Nyika by other observers. Recorded in Vwaza Marsh WR (25).
Neotragus moschatus (as *N. livingstonianus)*	Suni	(26)	Probable misidentification. All other records in Malawi are in the Lower Shire.

Note: Taylor (2013) lists one isolated record from Nyika Plateau; given as '?' on map. This species occurs in highland areas of East Africa.

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