FOREWORD

C. Peter Overton
Project Director, Biosearch Nyika

This report covers the second consecutive year of exploration of the northern hills of the Nyika National Park by Biosearch Nyika. This time we were assisted by a fourteen strong team from Southampton University Officers Training Corps. The strong logistical bias in this report is necessary to fulfil the requirements of the University Group. Notwithstanding this, collection of data for scientific research in remote areas rests heavily on efficient logistics and management of a team. It is surely right that this aspect should receive the same high profile as the scientific reports.

The personnel requirements for effective data collection, support for qualified scientists and proper reporting of the findings in reasonable time are not easy to meet. This is particularly so in an environment that is so physically demanding on a European support team who have very little time to adjust.

It has to be said that to maintain a totally cohesive and focussed expedition team without some difficulties along the way is nigh impossible. This team was able to show that nothing is impossible with good preparation and training.

The group of undergraduates and recent graduates, men and women, were all of excellent character. The leadership of Chris Nagle brought the best out of them and the whole expedition. They encouraged and were encouraged by our excellent Malawi associates to produce yet again some really valuable research and monitoring work in this remote wilderness. One of the consequences of this project is that we have now managed to secure funding from the British High Commission in Malawi to provide substantially improved field equipment for the scouts in the Nyika National Park. This will extend the period of the year when they are able to effectively patrol the wilderness areas in particular.

The intelligence on poaching activity in the remoter valleys is already being put into use in policy making in the Nyika National Park. The assessment of animal movements and relative abundance, which has been built up over the two years so far, is establishing a baseline that hardly existed before. In addition the group has assisted our small mammal, botanical and entomological research work in association with major research establishments to produce, as the detailed reports that follow will show, surprising and important discoveries to highlight the immense conservation importance of this mountain area to Central Africa.

I would like to thank the staff of the Department of National Parks and Wildlife in Malawi, led by Mr John Mphande, and all the many associates and supporters of this work around the world whose advice and interest propels this project onwards. On their behalf I also thank the Southampton team for their excellent organisation to achieve the successes in 1998.

Teams seeking remote area experience and wishing to contribute to wilderness and wildlife conservation are welcome to come forward to assist in this ongoing project.

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1. EXPEDITION SUMMARY

Chris Nagle, Expedition Leader

1.1 EXPEDITION BACKGROUND

Biosearch Nyika - Katumbu Challenge was an adventurous scientific expedition to the Nyika National Park in Northern Malawi between July and August 1998. The project was the fifth major expedition to be planned and executed by Southampton University Officers Training Corps since 1994.

The Nyika National Park is a vast area of bush located in the remote northern tip of Malawi. The terrain varies in altitude from over 8,000 feet near Nganda peak, to below 2,000 feet near Lake Malawi. The terrain ranges between steep treeless grassland and classic African bush. There are no roads and no villages.

Nyika suffers from the pressures of Malawi's ever expanding population and predictable lack of resources. Some 24 Rangers are responsible for policing the 3,142 square kilometres of the Park, with no radios, one truck, and a handful of motorbikes. The Park's fauna and flora is under pressure from illegal activity and the lack of resources to control this.

1.2 Aims

Katumbu Challenge aimed to help secure the future of the Park by raising awareness of this little known area through data collection and publication. With quantitative data regarding the biodiversity of the area along with an accurate assessment of the cumulative effect of widespread poaching, national and international initiatives can be planned to better manage the Park.

In addition the expedition aimed to educate and enhance the leadership development of the participating Officer Cadets.

1.3 Project Planning

The bulk of the Malawi activity was planned and organised by Peter Overton, of Biosearch Nyika. Peter was approached on the recommendation of the Expedition Advisory Centre at the Royal Geographical Society. After agreeing the principles of the expedition, Biosearch Nyika was contracted to organise the Malawi phase of the expedition. This policy ensured success in Malawi and eliminated the need for a reconnaissance or an extended advance party. Keen to cut costs and promote ownership among the expedition members, Southampton University Officer Training Corps was responsible for getting the team, complete with the right kit, to and from Malawi. In country SUOTC were to manage the logistics and run the teams once on the Nyika Plateau. The plan worked extremely well. Biosearch Nyika was clearly keen to maintain good relations with the authorities in Malawi and so showed a natural interest in how the team operated both before and during the expedition. Very soon Peter (who was in Malawi for the duration of the project) felt able to leave us to our own devices. As the Expedition Leader I felt entirely comfortable with this arrangement and the teams flourished in the field.

1.4 Outline Execution

The expedition deployed to the Nyika area by road. Once base camp had been established the teams trekked into the surrounding wilderness to begin data collection. Over the three survey phases, each group rotated through the base camp where botany and small mammal studies were undertaken. The expedition ventured further into the Park with each phase, studying a diverse range of habitats and terrain. After three weeks the teams returned to Lilongwe via Lake Malawi and Liwonde game reserve. The data was successfully collected with no serious injuries, sickness or loss of morale, despite the harsh conditions.

1.5 Flexibility

As with every expedition that I have been involved with, the key to success was flexibility. We were very keen to ensure that adventure was an important feature of the expedition and so the original plan evolved to ensure maximum activity and calculated exposure to risk. Instead of manning a permanent base camp staffed by key expedition members, the entire team trekked deep into the bush on weeks two and three. This enabled me to maintain an element of control over the activities despite the miserable failure of radio communications. The decision to move deep into the Park area without effective communications undoubtedly increased the risk to a casualty needing evacuation. On the other hand, the group was able to cover more area, command and control was maintained, individual and team self-reliance increased, and flexibility was enhanced.

1.6 Liaison

Liaison with people of various cultures and agendas is often a major sticking point. Often local people and scientists have very different values to students and military personnel. Not surprisingly, the teams made immediate friends with the Malawi Scouts and Captain Ken Tembo from the Malawi Army. The relationships with the scientists took longer to establish but were ultimately successful. Communication was relatively easy with all Malawi personnel involved speaking English. Peter Overton acted effectively as go-between and for initial introductions where his prior knowledge was invaluable. Overall, the Malawi people were a pleasure to work with (even including the Customs Officials at the airport) proving to be competent and dedicated.

1.7 Finale (R&R)

Biosearch Nyika organised a neat R & R package at the end of the fieldwork. The teams were looking forward to tasting ‘civilisation’ after three weeks in the bush and were not keen to go to the resort billed as being a quiet retreat from the hubbub of the town bars. Having had three hours of town hubbub (more than enough to satisfy our curiosity) we arrived at an idyllic resort on the shore of Lake Malawi, and regretted not having gone straight there. The long drive to Liwonde Wildlife Reserve was well worth the experience, but rather abbreviated. In all, more time should be allocated to R & R where possible. The drive from Nyika to Lilongwe via Lake Malawi and Liwonde involves over 24 hours of driving and should be spread over more than 3½ days.

1.8 Finance

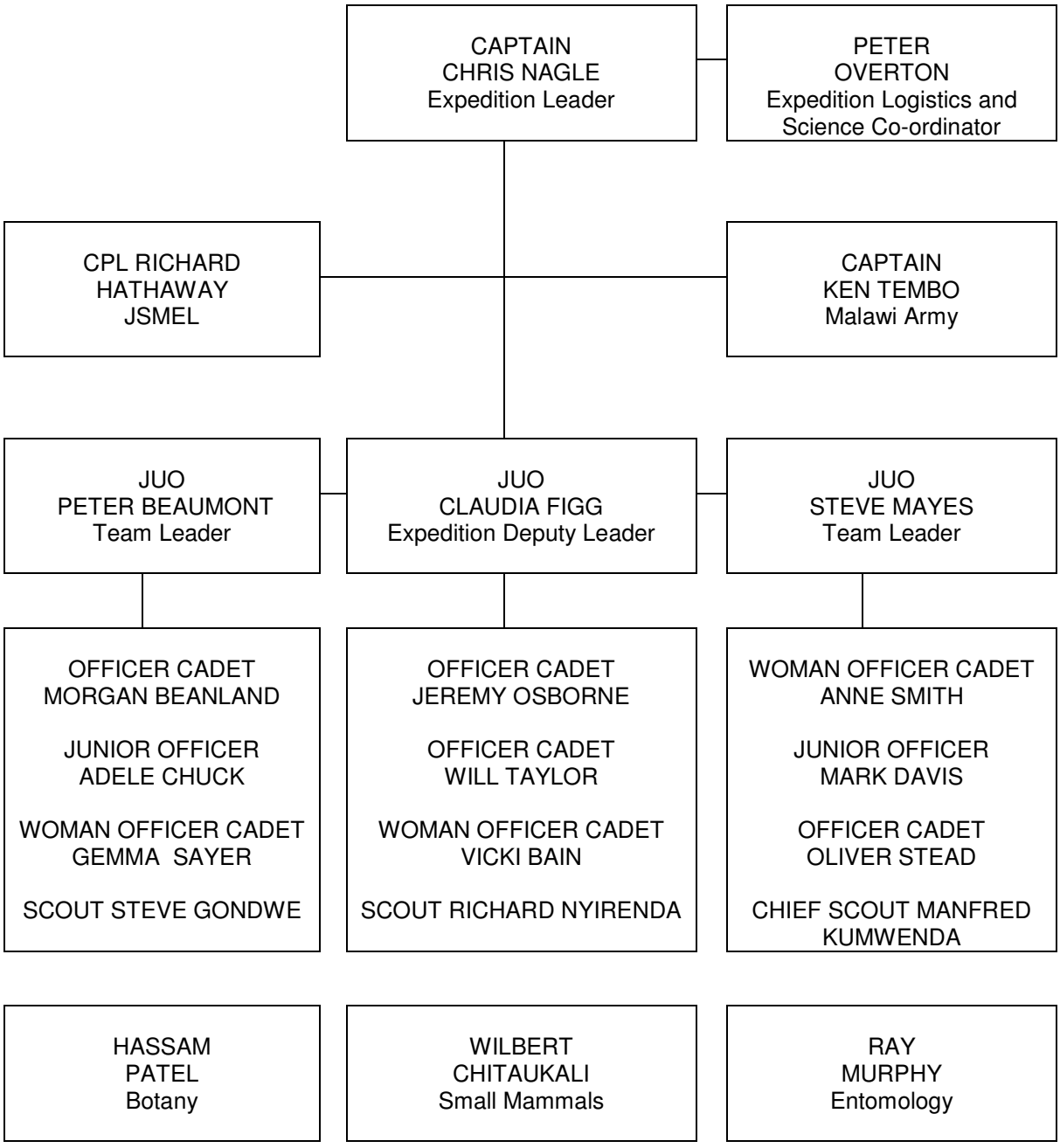
I was particularly disturbed by the way that changes to funding of Territorial Army units affected this expedition. With the partnership with Biosearch Nyika, and hence a meaningful project and scientific output, this project was never going to be a 'cheap' expedition. As the bulk of the money comes from personal contributions, participating students are hit particularly hard by expensive expeditions. Usually personal contributions are offset by TA pay at the end of the project. Typically 28 days pay yields £700 per person, making a £1,300

contribution good value. On the build up to Katumbu Challenge I was given no firm indication of the pay (if any) that each Cadet could expect. This caused unnecessary financial stress on the expedition as a whole. Eventually, the Cadets were offered 7 days pay, which was raised to 12 after much begging. It was a pity that in 1998, the efforts of this expedition were not suitably rewarded. Thankfully, the 1999 Southampton University Officer Training Corps expedition to Guyana has been promised 28 days pay from the outset. As in previous years, Southampton University and The Ulysses Trust were extremely generous in their donations.

1.9 Conclusions

For the fourth year in a row, Southampton University Officers Training Corps successfully mounted a complex expedition to a remote part of the globe. Yet again, value was added to the training by including a research objective with Biosearch Nyika. SUOTC have now established themselves as a serious expedition unit and it is gratifying to see that the tradition will continue in 1999. The unit has now accrued a wealth of knowledge on successful expeditioning covering a wide spectrum of activities. The time has come to build on the previous expeditions. The inclusion of local knowledge is a vital aspect in any expedition, even more so when reconnaissance is a luxury and scientific objectives are involved. Twelve months is unlikely to be long enough to successfully plan and execute a foreign scientific expedition alone. The partnership with Biosearch Nyika was an essential part of this. Research will always add complexity to a project both on an organisational and interpersonal basis and is likely to add somewhat to the cost but will also enable teams to contribute to a recognised scientific output, which has more than just a temporary impact on the expedition area. The adventurous training system in the forces does little to encourage adding value to expeditions through research/community projects. I believe that expeditions can benefit both host country and participants with just the same level of activity and adventure as ‘bagging peaks.’

2. EXPEDITION HIERARCHY



3 RISK ASSESSMENT

3.1 INTRODUCTION

The risk assessment was written by Biosearch Nyika based upon their considerable experience of the expedition area. The content was agreed by Southampton University Officer Training Corps and Biosearch Nyika and all expedition members were required to sign copies of the document.

3.2 HAZARDS, CONTROL MEASURES & OUTCOMES

This was not intended to be a totally comprehensive appraisal but aimed to deal with what were perceived as some of the major issues that, through experience working in the area, needed consideration. This document was discussed with all participants in an open forum, amended where necessary and signed by all team members as part of the agreement with Biosearch Nyika. In any expedition, conditions may of course arise where adherence to ideal risk control practises may be waived if the leader considers the increased risk resulting is acceptable. However, the over-riding principle was that the proposed activity would be abandoned or re-scheduled rather than infringe agreed control recommendations.

3.2.1. Hazard: Travel to basecamp by road and return journey

Risk
A moderate risk of accident due to collision or coming off the road, with potentially serious consequences.

Assessment and controlling measures
Much of the road that will be travelled is in good condition but there are a few deep and dangerous potholes and broken bridges. Transport has been arranged through experienced safari operators with well-maintained, expensive four-wheel drive vehicles. These are driven by regular, employed drivers whose livelihood depends on unblemished records. No night driving is scheduled on public roads. Speed limits will be enforced by the organisers, with special reference to known danger areas on the route.

Actual experience
Road travel was generally a good experience with professional drivers and adequate vehicles. The return journey was marred by a poor roof rack, which despite having survived the 800 km drive to Nyika lasted only 3 km when carrying kit. For the next three days our equipment was stowed in the bus.

3.2.2 Hazard: Team members

Risk
Inadequate training and experience, personal equipment or poor attitude. Existing medical conditions.

Assessment and controlling measures
Biosearch Nyika have issued detailed advice notes and provided an expedition training day in Southampton to further assess these matters and provide guidance. Personnel selection is outside the control of Biosearch Nyika but they have confirmed the crucial importance of careful team selection. Medical declarations are part of the agreement as is proper first-aid training for all members. Full equipment lists have been issued.

Actual experience
The team was selected from a talented pool of fit and motivated individuals. All cadets undergo selection for the unit and exhibit above average levels of self-discipline. Wilderness Expertise Ltd conducted an excellent remote medical course to brush up on the basic first-aid that all members were trained in. There were no breaches of discipline during the expedition.

3.2.3. Hazard: The Environment on expedition

Risk
Steep Terrain, Altitude and Climate. A high risk of altitude sickness and heat exhaustion caused by lack of fitness and intense sun with high risk of burn on arrival at basecamp at 7400 ft.

Assessment and controlling measures
Limited physical activity for the first few days, especially over the middle of the day. Major forays scheduled for later in the expedition - slow build up. Hats and neck protection essential at first even for natural 'tanners'.

Actual experience
All members adequately protected against the sun and cold. Team fitness was excellent and did not limit activity at any stage. Heat injuries proved more of a hazard in lower lying areas. Any sign of exhaustion was dealt with at once by resting the vulnerable person.

3.2.4 Hazard: Ill-health and tropical diseases

Risk
Very high risk of diahorrea, malaria (low risk in expedition area but high on the lakeshore), other diseases caused by polluted water etc. (low risk)

Assessment and controlling measures
Asthma may be aggravated at first due to altitude but generally is improved by the clean air conditions and open-air living. Proper inoculation and prophylaxis before and during the expedition is essential, according to medical advice notes. Take own hypodermic needles in the event of necessary treatment in Malawi. Aids is a major problem in the country and most of the hospitals are desperately short of even the most basic resources. Proper management of hand-washing water at toilets (ignored by many expeditions) can reduce diahorrea substantially. Abundance of water in fast-flowing mountain streams makes this expedition area potentially very healthy. Problems are frequently down to poor management.

Actual experience
Hygiene was strictly enforced with hand washing available at food preparation/consumption areas. Water collection was separated from washing areas and latrines carefully sited. Extensive medical kits carried (improved from the accumulated experience of several expeditions). Drinking water was purified using iodine solution regardless of the apparent cleanliness of the source. No instances of diahorrea or vomiting were recorded.

3.2.5 Hazard: Hiking and camp living

3.2.6 Risk
Physical injury due to falls on steep slopes or on slippery rocks in the rivers potentially serious because of the remoteness of the area possibly requiring lengthy stretcher exit. Stings and bites from insects; these are unavoidable but the area at this season is probably not as bad as the U.K. in a normal summer. Basecamp will be cold morning and evening and has few flying insects. Expect modest problems in the lower valleys. Snakes, baboons, leopards and other animals. Very low risk.

Assessment and controlling measures
Comprehensive medical kits to be taken with every foray group and relevant skills to be present in each group. Good hiking boots to be worn at all times. Night forays generally ill-advised. Protective clothing to minimise bite and sting risk (long trousers); although in the case of red ant attack rapid removal of all clothing is recommended. Avoid close proximity to potentially dangerous animals i.e. give troops of baboons a wide berth. The only injuries ever recorded by leopard were when one was cornered in a chicken pen. They are shy and largely nocturnal. Groups will be attended at all times by a game ranger with an M16 automatic rifle.

Actual experience
No night moves were permitted. All members had adequate protection and suitable equipment. Footwear did prove to be important with risks high around fires.

3.2.6. Hazard: Interaction with local people

Risk
Disease, Attack or Theft of belongings, Kidnapping. All these risks very low.

Assessment and controlling measures
Aids and Malaria are dealt with elsewhere. Malawi is a politically stable country with a strong tradition of respect for visitors. Theft is only likely to be a problem in a few urban areas, which are largely out of the itinerary of the group. In the rural areas strong community ties make crimes against the person scarce. Poachers operate in the expedition area but there have been no incidents of aggressive behaviour in the Nyika National Park. The Department of National Parks and Wildlife receive intelligence reports regularly and will advise us if the situation is perceived to have changed. They do not give authority for expeditioning into any wilderness areas which may be dangerous to visitors. The British High Commission in Lilongwe are aware of the programme of work and we have personal contact with the High Commissioner there.

Actual experience
There were no hazardous nor unfortunate contacts with the local people.

3.3 EMERGENCY EXIT PROCEDURE

Procedure in the event of serious incident necessitating removal of one or more team members from remote valleys.

1. If radios are both available and working call base camp or, better, Chelinda direct, who can call up a light aircraft from Lilongwe or Mzuzu, on their own radio, to be waiting at the Nyika airstrip. Radio frequency to be advised on arrival. Full training in the use of the radios for all members of the expedition will be essential.

2. If no operational radio, send a scout ahead as a 'runner' with the fittest member of the team, free of all baggage, save first aid kit and minimal provisions. An exit route will have been agreed on the map before leaving the remainder of the group who will follow this route exactly.

3. The remaining group will have an armed scout and can organise the necessary support for the injured party. A stretcher can be made from rucksack straps and cut poles. All unnecessary baggage must be left. No attempt must be made to rush the strenuous exit, which may involve a climb of 1500m, resulting in possible further exhaustion or injury. A relief team will be sent down as soon as possible.

4. The time from Basecamp to the airstrip is about 1 hour by vehicle or 2 hours using a very fit runner (23km). The expedition does not have budget for a standby vehicle but cover will be available for some of the time.

5. The time for a fit 'runner' from the more remote areas of the valleys is one full day (12 hours). Travel at night should be avoided since the risks may exceed any benefits over the time scale involved.

6. Expedition leader should be aware that remoteness, regardless of physical risk, which is very small, can create anxiety in novice team members. This matter must be discussed and adjustments made to groups and working areas if appropriate.

7. Hospital treatment would be likely to be in Johannesburg. Experienced rescue back-up by road and by air are now available from the Chelinda forest camp, near the airstrip on the plateau. (Contact: D Foot, Nyika Safari Company)

Actual experience

The team were repeatedly reminded that Nyika was a remote area and that the consequences of a 'casevac' were likely to be dire for the individual involved and the expedition as a whole. Members were reminded of their responsibility not to put themselves and the expedition in jeopardy by exposing themselves to unnecessary risk. There were no incidences of excessive exposure to risk and the team maintained impressive restraint and discipline. The failure of radio communications and the lack of support vehicles at base camp would have made a casevac most challenging.

4 FIELD DIARY

PHASE ONE

Date	Activity	Remarks
9/7/98	The expedition congregated at Southampton and departed for Gatwick.	6 ½ hours were allowed for final preparation, and were needed.
10/7/98	Arrived in Lilongwe, exchanged cash, met Peter Overton, Advance Party and mammal specialist. Depart for Nyika. Overnight at government lodge 1 hr south of Mzuzu.	P.O. and Advance Party had acquired transport, rations, and diplomatic clearance to import radios. Lodge was excellent.
11/7/98	Departed lodge by 07:15 but delayed in Mzuzu. Collected botanist and visited entomologist. Arrived Chelinda too late to proceed to Base Camp (altitude 7,500') S 10°26'32.5" E 33°51'00.5". Made camp at commercial site in Chelinda. Liased with Nyika Safari Company (NSC) and Park Scouts.	Campsite was crawling with Hyenas who were partial to food, plates and motorbikes. NSC proved a reliable source of information and assistance.
12/7/98	Wet dull day en-route to Base Camp. Erected camp and established routine before commencing detailed planning. Large mammal teams split a 100 km square and randomly selected survey grids within this area. Botanists were given strict limits of exploration.	Base Camp below Nganda peak (altitude 7,400ft) and close to the Nganda track. Road passable by rugged 2WD vehicle in dry season.
13/7/98	Personnel break down into three teams to cover botany, small mammal and large mammal survey. Local radio check is completed and preferred frequencies selected. Team Scouts arrived. Camp built and basic amenities constructed. Team Leaders discussed research with respective specialists and lodge detailed patrol plans at base camp.	The Scouts allocated to the teams proved to be high calibre individuals. They brought approximately 15 long wooden poles that proved invaluable for camp construction.

PHASE TWO

14/7/98	Two Large Mammal teams departed on surveys by 08:00. Small mammal and botany team remained close to Base Camp. All teams concentrated to east of Nganda peak. Entomologist developed malaria and returned home, taking our only transport. Catabatic winds howled through the base camp morning and night making it very cold. Grass fires swept towards basecamp from the north-west but stopped in a gully about 1 km from us.	Complete failure to establish HF communications with outlying groups. A detailed plan covered this event but required the teams to be back in camp 72 hours after loss of communications. Unable to establish communications with Parks Service or NSC
15/7/98	Dispatched camp Scouts to one large mammal team with new frequencies to try. Observed the carcass of an Eland shot by poachers. Surveying continued as planned.	Still no radio contact with large mammal teams or Chelinda.
16/7/98	Get a fleeting radio contact with one team on new frequencies. Planned 3rd week with Nyika Park Scientific Officer, Gibson Mphepo. Rejected plan to venture far into the north east	Best frequency was 8.360 MHz but line of sight could have been the sole cause of success.

	due to casevac limitations. Trekked to summit of Nganda for evening radio broadcast. In freezing conditions, established communications with both groups and prevented enforced return to base camp.	
17/7/98	Survey continues.	
18/7/98	P.O. and one Team Leader departed to Mzuzu on the re-supply. Scouts are replaced.	
19/7/98	The botany team arrived bright and early from their surveying and transferred samples into storage presses. By 11:00, all the teams were back in base camp in good shape. The re-supply arrives at 16:00.	The Malawi Army representative left having developed a bad infection in the foot. Fresh food was a welcome luxury.
20/7/98	Teams recouped and planned the next phase. The entire expedition was to move to a sub-base camp and work from there. Guards will secure the kit left at base camp. Radios were discarded.	In a last ditch attempt to make use of the HF radios a set was taken to Chelinda to experiment with the settings in the hope of at least talking to NSC. This failed.

PHASE THREE

21/7/98	08:55 the expedition departed the base camp. By 16:00 the group made camp near the Mondwe River at about 4,800' altitude, the nights were a lot warmer. The entomologist introduced us to blow flies, reputed to lay eggs in one's sweaty areas, general panic ensued!	Clear trails maintained by animals and probably also poachers enabled relatively easy travel. Transit over high ground proved easier than following streams.
22/7/98	The work resumed with one team operating from a camp 2 km downstream and the others from the sub-base camp. A great deal of poaching activity was evident in the area with snares, meat smoking fires, beehives and campsites.	We did not observe any fish in the Mondwe River despite what appeared to be ideal conditions.
23/7/98	Continued survey, spotting much evidence of elephant, buffalo, and other large species. Entomologist had little success and planned to return to Mzuzu.	Low insect activity may be due to dry conditions.
24/7/98	Close sighting of poachers 6 km from the camp, chase given by the scout but trail rapidly lost in the dense bush. Re-supply departed for base camp and Mzuzu.	Much evidence of poaching activity found in the survey area.
25/7/98	Survey continued, all teams back in sub-base camp that evening in preparation for the return trek.	Camp was struck as far as possible to enable an early start.
26/7/98	05:45 reveille but Scouts delayed departure until 06:50. With lighter loads and the prospect of fresh food, the long climb to base camp took only 6 hours, 1 hour less than the walk out.	The re-supply vehicle arrived at 16:00 complete with the visiting Commanding Officer. We froze in the windy Base Camp.
27/7/98	Day of rest, washing and planning.	

PHASE FOUR

28/7/98	07:45 departed from Base Camp. By 14:30 we had located a suitable sub base camp by the Sawi River (4000' altitude). The camp appeared to be a well built poacher camp complete with hut, utensils and tools.	It was decided to occupy the poacher camp in order to make our presence as overt as possible thus reducing the likelihood of contact.
29/7/98	One large mammal team set up a satellite camp and the activity began. Teams were suffering from the heat at this altitude and the extremely rough terrain.	This area of the Park was rarely visited by the Rangers and so was heavily poached.
30/7/98	One team had followed the course of the Sawi and collected 12 snare wires.	The teams were highly motivated by collecting the snares. Although only a short term solution to the poaching problem, the group felt that they were actively combating the poaching threat and enjoyed the challenge of seeking out the cleverly concealed wires.
31/7/98	After a half day of surveying, two teams patrolled the nearby water courses for snares. 26 were collected and a trap for big cats was destroyed.	
1/8/98	Much of the day was dedicated to searching for snares and traps. The Commanding Officer left to make his transfer out of Malawi.	
2/8/98	Left sub base camp at 06:50 having burned the poacher camp. The walk back took 7 hours. We were greeted by a very cold and windy night at Base Camp.	
3/8/98	A thorough clean up of Base Camp began. All toilets and pits were filled. The transport was spotted and by 14:30 a very full bus was on its way to Chelinda. The expedition stayed at the youth hostel in Chelinda, where hot showers existed.	Once the camp was cleared, the tension was tangible. Had the bus not arrived, I would have had trouble preventing people from walking the 27 km to Chelinda!

PHASE FIVE

4/8/98	Part of the team took a dawn horse ride and the rest ate a hearty breakfast at the Chelinda restaurant. Soon we were en route to Mzuzu on a very dusty trail.	The expedition stayed overnight in Muzu in a comfortable motel.
5/8/98	By bus to Lake Malawi. Overnight at the delightful Chintechi Inn on the shore of the lake. The setting was idyllic but too short in duration.	The towns dotted along the lake shore offered limited opportunities to eat, drink and buy gifts.
6/8/98	Long bus ride (8 hours) to Mvuu Camp in the Liwonde National Park. Magical experience including safari tents, dusk river trips, spectacular barbecue, night safaris and dawn boat trips.	Again too short.
8/8/98	Early start for Lilongwe. Have approximately 3 hours in the town before heading for the airport. Those members of the expedition remaining in Africa departed at this point.	Freight limitations at the airport required some fast talking to avoid the proposed US$2,000 excess baggage charge (tropical wood carvings are heavy).

5 SCIENTIFIC OVERVIEW

Morgan Beanland & Anne Smeeth

5.1 INTRODUCTION

The scientific work included a large mammal survey, a small mammal survey and a botanical survey. A shorter period of entomological work did not involve assistance from SUOTC. The team was split down into three sub-groups so that more work could be achieved as well as giving each group the opportunity to work with the three surveys.

Background

Over the two years Biosearch Nyika has contributed greatly to current knowledge. A measure of the extent of the work, might be taken as the number of species identified.

Table 1: No. of Species Identified on Nyika: July 1997/8

Group	Total	New records
Plants	1146	5
Insects	492	253
Birds	164	1
Small Mammals	22	7
Large Mammals	27	2

In addition evidence of poaching has been documented in the 1997 report and in chapter 7 of this report.

Phase 1: Area 1 To the East of Nganda

Tuesday 14th – Sunday 19th July / 10x10km delimited by Grid references 9440 - 0450

In the first phase the area to the East of Nganda was surveyed. Group 1 and Group 2 split the ten kilometre square in half with Group 1 working in the southern part and Group 2 in the northern part. Group 3 remained at base camp working with the scientists.

The terrain was very hilly and was made up of grassland and low shrubs. Poachers trying to tempt animals with the newly grown shoots in the burnt areas had burned a large percentage of the area. Animal sightings were few and consisted mainly of Roan Antelope and Eland. There were many prints and droppings, the most notably of Bushpig or Warthog, Aardvark (diggings), Roan Antelope and Eland. The surveying was made easy by the short grass and the effect of burning.

Group 3 spent this first week with Hassam Patel and Wilbert Chitaukali in base camp. Two people went with each of the scientists, changing half way through the week. Hassam went out for two nights at a time, firstly to the north-east and then the south-east of Nganda. Nganda is the highest point of the Park, 1km from basecamp.

The team's lack of plant knowledge meant that they were not of much more assistance than marking out the five meter square quadrats from which Hassam logged all the plant species. Several species new to the area were found and pressed for further study. Meanwhile Wilbert found a large number of small mammals around the base camp, especially on the north side in the longer grass. Setting the traps was a simple process of checking them and smearing fresh peanut butter in the traps twice a day, but many escaped!

Phase 2: Area 2 Chipome Valley and tributaries
Tuesday 21st – Sunday 28th July / 10x10km delimited by Grid references 8654-9664

The teams moved out together, with Groups 2 and 3 working on the large mammal project and Group 1 working with the Scientists. Group 1 split so that two members went to Group 3's sub-camp to work with Hassam on the plant survey for two days and then returned to the main sub camp to change over and work with Wilbert on the small mammal project.

This phase involved a longer trek down off the plateau and into the Mondwe and Chipome Valleys.

The terrain consisted of tree and grass savannah and there were more rivers and streams in the area. Although the map contours present this area as relatively flat, this is deceptive as the ground in consistently undulating.

A sub-camp was established at 911571 and Group's 1 and 2 were based here. Group 3 and two of Group 1 moved onto a sub-camp further down the river.
Locating the grid squares was difficult, as the vegetation was taller due to the altitude, soil and water. The high ground was found to contain less animal activity than the lower river bed areas.

Phase 3: Sawi-Guwu Valleys
Tuesday 30th July – Sunday 4th August / 5x6 km delimited by 9656 - 0261

Groups 1 and 3 worked on the large mammal survey and Group 2 worked with the scientists. Two of Group 2 moved off with Group 1 to a sub camp and then returned to the main sub camp after a couple of days to change over from plants to small mammals.

This phase involved a long trek into one of the most densely wooded areas of the Park. The altitude was lower than the previous two weeks and the vegetation reflected this. The trees and vegetation were a lot taller, with some grasses reaching over 2m. tall. This made the large mammal survey very difficult at times as the teams could not always clearly identify the animal activity. There were more animal sightings including many small antelope and a troop of baboons.

Fewer rodents were caught, but the plant survey was very successful with many plant specimens collected.

This phase revealed the most prolific poacher evidence with our sub-camp by a poacher's shelter. It was thought that it would be of value to spend a day conducting a poaching survey. This revealed 64 snares along one river alone.

5.2 LARGE MAMMAL SURVEY

For the large mammal survey each group spent two out of the three one-week phases collecting data. Each phase lasted six days; this included the hiking time to the sub-camps. The third phase was a rotation of the week spent with the plant and entomology scientists.

5.3 SMALL MAMMAL SURVEY

Wilbert Chitaukali, Curator at the Museum of Malawi, led the small mammal survey. Two members of the SUOTC supported this survey, on a rotating basis to allow everyone to improve their experience and knowledge.

5.4 BOTANY

Hassam Patel of the National Herbarium of Malawi conducted the botanical survey. Two members of the Southampton University Officer Training Corps on a rotating basis also supported this detailed and interesting survey. Hassam Patel has an extensive knowledge of the plants of Malawi and their medicinal uses. Many specimens were taken and pressed for reference collections and for further study. Some of these samples will in due course be sent to Kew Gardens in England, as in previous years.

5.5 ENTOMOLOGY

Ray Murphy carried out a small entomological survey. Due to illness, this survey was cut short. This report does, however, give Ray Murphy an opportunity to update his findings from the 1997 expedition work and offer a complete list of Nyika National Park records.

4 LARGE MAMMAL SURVEY

Peter & Marianne Overton with Chris Nagle

INTRODUCTION

The northern hill zone is particularly difficult to access so that the Park Scouts alone are seldom able to patrol the area, let alone carry out detailed scientific research into changes in animal populations. Decisions regarding how best to manage the area and perhaps utilise its assets are being made. Fundamental information regarding the diversity and distribution of mammal populations is needed. By repeating the survey, changes can be monitored.

This survey repeats the method carried out in the previous year to assess the level of activity of large mammals in the northern hills. This information is thus supplementary to the report produced in 1997. (Ref: *Malawi 1997 A biodiversity expedition in the northern hills of the Nyika National Park*. Ed. Marianne J.Overton.) A poaching report is also included.

6.1 OUTLINE OF METHOD

The method is fully discussed in the 1997 report. Relative abundance of animals was gauged on the presence of tracks, signs and droppings. A relative abundance score is established for each species in each 100mx100m plot. These scores are then summed for each kilometre square and mapped, to demonstrate distribution of each species over an area.

6.2 CHOICE OF SITES

In 1972 the map and terrain were carefully studied and habitat zones identified. (*Wye College 1972 Malawi Report*) From a reconnaissance in 1996, three primary habitat zones were selected and studied in 1997. Zones were restricted to roughly 10x10km, which was considered an amount that could be sufficiently surveyed to get representative results in the time available.

Five 1-kilometre squares within the zone were randomly selected. Randomness was achieved by putting the grid references of the bottom left corners of each kilometre square within the 10 kilometre square zone, into a hat. Some realism was required about the squares that are pulled out of the hat: If the square represents an inaccessible cliff face, disregard it and select another square.

6.3 METHODOLOGY

Method of Survey

The choice of method and its development was discussed fully in the 1997 report. In 1998 the method was explained to the field workers as a set of instructions;

- Divide the kilometre square into 100m plots.
- Randomly select 5 plots for detailed survey.
- Mark 10m intervals along the opposite ends of the plot with poles.
- Five people (team members not scouts) walk parallel along the mid-line of each 10m interval, looking at the 5m either side of their path.
- The team moves back and forth in this fashion until the entire plot has been intensively surveyed. The scouts move up and down the line of people responding to requests to aid identification.

- The team members make notes of their findings as they work through each plot. The team's results can then be gathered and recorded by one team member at the end of each day.

Recorded Data

- Refer to the animal print identification card.
- Before you start each plot you need to record the following:

Location: Map grid reference, plot grid reference, altitude
Team name: Name of recorder, date, time, and weather.
Habitat: Percentage tree cover, shrubs, grass, bracken, or marsh;
Proximity of water; incline and aspect.
On survey: Species – tally under print, droppings, other signs (digging, grazing)

Data Processing

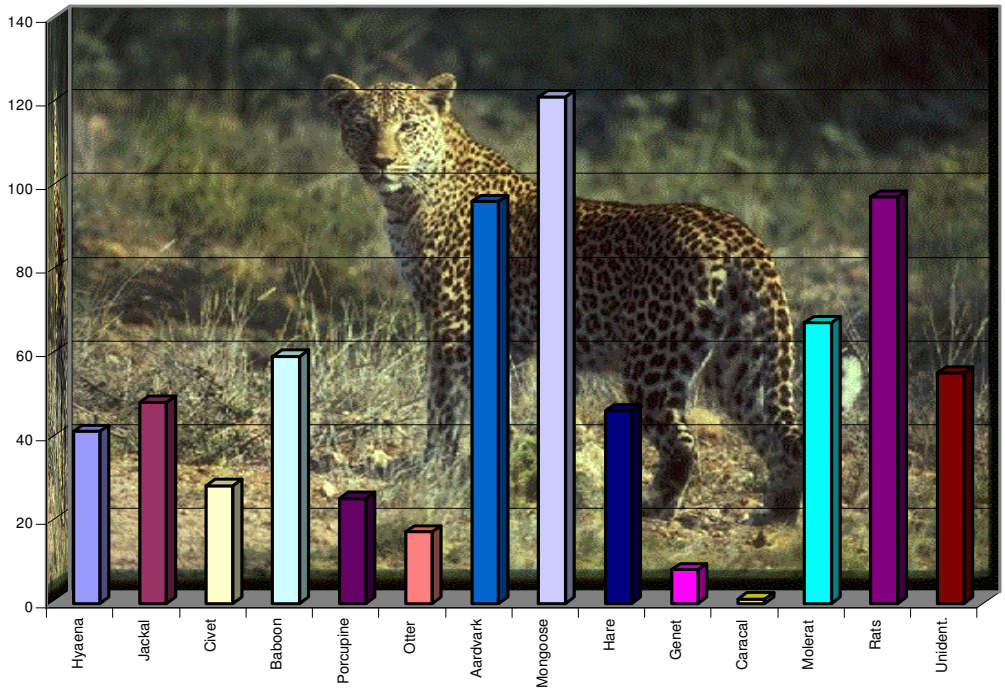
- Combine the data from each plot. For each plot calculate the relative abundance for each species.

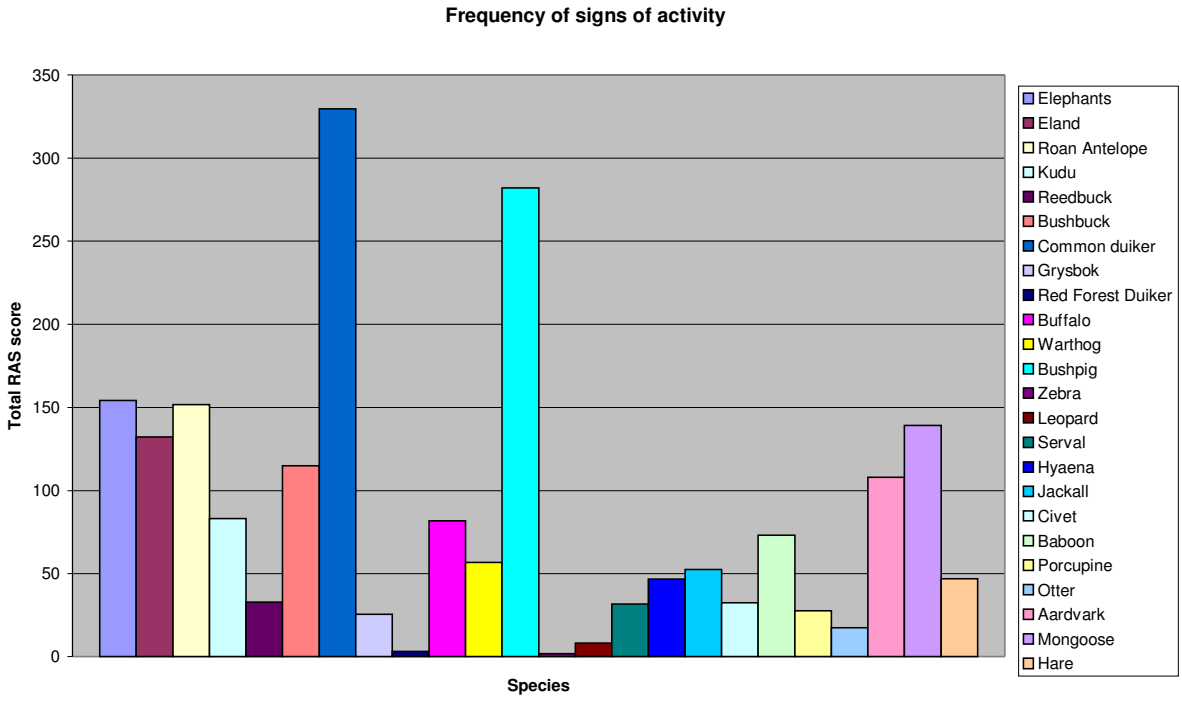
  The Relative Abundance Score = number of times sighted or sets of droppings plus the number of times tracks or damage are noted up to a maximum of three.

  Total score for the square kilometre = sum of the scores for each plot.

The scores can be plotted onto a map for each species, to illustrate distribution and used to compare data from one year to the next.

Total scores given for signs of activity for some species





6.4 SURVEY AREAS

These are noted on the foldout map at the back of this report. Three major biogeographical areas were selected in the hill zone off the plateau to the north of the National Park. These broadly correlate with the topographical regions defined by J A Hargreaves in the Wye College 1972 Soil Report. Specifically, 8b to the east of Nganda, 7b and 7d around the Chipome and tributary river valleys and 5g in the Sawi and Guwu valleys. Surveys were carried out over five days in each area from the 14/7/98 to the 31/7/98, covering Areas 1-3 in that order. The randomly selected locations of the kilometre squares studied in both 1997 and 1998 are shown in map.

Area 1: East of Nganda.

This is a steeply undulating area of high grassland (7000-7500ft) with some *Protea* scrub and evergreen forest patches, largely in the steep gullies and an occasional dambo wetland area. Much of the grassland had been recently burnt. The streams here run throughout the year, fed from groundwater, from rain falling on the plateau. Of the 47 plots surveyed the majority were 100% grassland. Kilometre squares numbered 23 to 32 are in Area 1.

Area 2: The Chipome Valley and its tributaries

(including the Mpero, Mondwe and Nkhata valleys)

This covered an altitude range of 4500 to 6000 ft and is mainly covered by *Brachystegia* woodland. Recorded tree cover over all the plots averaged 28%, though the canopy may have been under-estimated. There are some areas of wetland dambo and cleared old village settlements which are open with much long grass of low diversity. The major rivers continue to flow throughout the year. Kilometre squares numbered 2 to 10 (1997) and 33 to 42 (1998) are in Area 2.

Area 3: The Sawi-Guwu Valleys

The altitude of the plots was in the region of 4000-4500 ft. Recorded tree cover averaged 31%, though canopy cover does tend to be under-estimated. This area is fairly similar to the Area 2 in topography and vegetation but the lower altitude and geographical location make it more accessible to the lake shore, which is likely to have a bearing on large mammal populations and movements. Kilometre squares numbered 14 to 16 (1997) and 43 to 50 (1998) are in Area 3.

Print-holding quality

The print-holding quality of the substrate was assessed in 1997 and illustrated in the report. The soils in detail for these three areas were described in the 1972 report. Much of Areas 2 and 3 have loose sandy soils, containing pebbles and stones, interspersed with boulders and subject to erosion. Thick leaf litter was encountered in some plots. On the higher ground such as Area 1, the soil has a higher organic content.

6.5 RESULTS

28 kilometre squares were studied, each containing up to five 100x100m plots. This is the largest survey ever undertaken in the region and compliments the 22 kilometre squares studied previously in 1997.

The fold-out Map of the survey area shows the distribution of kilometre squares surveyed for tracks and signs of large mammals over both 1997 (numbered 1 to 22) and 1998 (numbered 23 to 50). Squares 11,12 and 13 studied in 1997 are on the plateau and are indicated on the

key section of this map. Squares are spread randomly through the three major topographical regions of the northern hills, though inaccessible squares were discarded at the outset.

The number of large mammal species reported in the squares was 26, including the smaller Scrub Hare, Genet and Caracal. Elephant Shrew, Mole Rats and Rats were also recorded when they were encountered, although they are small mammals and not included here. A species list appears in Table 2.

Table 2: Species List 1997 and 1998.
Large mammal species recorded in the northern hills of the Nyika National Park. The systematic order followed here is according to Ansell and Dowsett (1988) after Meester et al. (1986). Some species were only recorded outside the plots.

Yellow Baboon	Ba	*Papio cynocephalus*
Scrub Hare	Ha	*Lepus saxatilis*
Porcupine	P	*Hystrix africaeaustralis*
Side-striped Jackal	J	*Canis adustus*
Cape Clawless Otter	Ot	*Aonyx capensis*
Civet	Ci	*Civettictis civetta*
[1]Rusty-spotted Genet	*G*	*Genetta rubignosa*
[2]Banded Mongoose	Mg	*Mungos mungo*
Slender Mongoose	Mg	*Galerella sanguniea*
African Striped Weasel		*Poecilogale albinucha*
Spotted Hyaena	Hy	*Crocuta crocuta*
Leopard	Le	*Panthera pardus*
[3]Caracal or Red Lynx	Ca	*Felis caracal*
Serval	Se	*Felis serval*
African Elephant	Ele	*Loxodonta africanus*
Burchell's Zebra	Z	*Equus burchelli*
[4]Aardvark	Aa	*Orycteropus afer*
Bushpig	Bp	*Potamochoerus porcus*
Warthog	W	*Phacochoerus aethiopicus*
Buffalo	Bf	*Syncerus caffer*
Bushbuck	Bb	*Tragelaphus scriptus*
Kudu	Ku	*Tragelaphus strepsiceros*
Eland	Ela	*Taurotragus oryx*
Common Duiker	CD	*Sylvicapra grimmia*
Red Duiker	RD	*Cephalophus natalensis*
Roan	Ro	*Hippotragus equinus*
Reedbuck	Rb	*Redunca arundinum*
Klipspringer		*Oreotragus oreotragus*
[5]Grysbok		*Raphicerus sharpei*

[1] Only one previous record from the Nyika National Park which was questioned as it is believed to be absent from the montane areas. (Ansell & Dowsett 1988) Not in Johnson (1990).
[2] Species not recorded in *A Visitors Guide to Nyika National Park, Malawi* (Johnson c.1990), but listed as widespread in lowland areas in *Mammals of Malawi* (Ansell and Dowsett, 1988) and signs positively identified by Park scouts. We have probably collected evidence of several mongoose species.
[3] Only one unconfirmed record for the Nyika. (Ansell & Dowsett 1988)
[4] Species not positively identified as being present in Nyika National Park. Large holes in termite mounds are locally believed to indicate their presence. More work is needed to establish clear differences between signs of Warthog, Bushpig and Aardvark.
[5] Tracks originally identified as Steinbok *(Rhaphicerus campestris)*. These species have been confused in the past; however, there are no official records of Steinbok in Malawi (Ansell and Dowsett, 1988).

Relative Abundance Scores

These indicate the levels of evident activity for each species, based on tracks and signs. These were calculated for 29 species, represented in Table 3 . Totals are given for each of the three survey areas. Since the areas were not each covered by the same number of study plots, "adjusted totals" have been included to enable direct comparison. These totals are all scaled to fifty plots. Zero denotes no evidence of a particular species.

Most widespread were the Common Duiker, Bushpig, Roan Antelope and Baboon, which appeared in more than two thirds of the kilometre squares. Rarest were the Caracal and the Zebra, each being found in only one square and that was to the east of Nganda. Similarly, the Red Forest Duiker was only found in two squares, in the same area, being confined to the montane evergreen forest patches.

Area 1
Area 1, at the highest altitude, indicated high diversity with 20 large mammal species, but the lowest RAS scores for overall activity, despite the easier recording of tracks and signs on the shorter grass.

The Reedbuck remained in the higher areas and was not recorded in areas 2 or 3. Other large mammals showing a preference for the highest altitudes of Area 1 were the Eland, Warthog, Porcupine and Aardvark.

Area 2
Area 2 was most favoured by Elephant, Roan Antelope, Buffalo, Serval and Hare.

Area 3
The 17 species apparently present in the Sawi-Guwu valley (Area 3) was lower than Areas 1 and 2 where 20 and 21 species of large mammal respectively were recorded.

However, the amount of activity at these lowest altitudes was the highest of the three areas for some species, such as Kudu, Bushbuck, Common Duiker, Grysbok, Bushpig, Hyaena, Civet, Baboon and Mongoose, and also scored highly for the Aardvark and Buffalo. Other large mammals scored lower, notably the Eland and Elephant, Porcupine and Otter for whom these lower wooded areas and rivers would seem to be appropriate habitat. Roan Antelope and the Scrub Hare prefer the more open habitats and would not be expected to be as common in the woodlands.

Comparison of 1998 and 1997 Data

Area 1 to the east of Nganda was not studied by the large mammal group in 1997. The plateau itself was not surveyed in 1998. The results for areas 2 and 3, however, are comparable. Adjusted totals for each species in each area for the two study periods are shown in Table 4. The period of study is spread over three weeks in 1997 and five weeks in 1998.

The seasons of study however, are significantly different. The 1997 study in March/April was towards the latter part of the warmer, rainy season whilst the 1998 study in July was well into the cold, dry season.

Even if populations remained the same, we might expect the total scores to be higher in 1998 for three reasons:-

1) The 1998 survey started two and a half months after the end of the rainy season. Droppings decay least in the dry season so may accumulate. The tracks are set after the rainy season and only gradually deteriorate during the dry season. The 1997 report states that June/July is the optimum time for this study. The 1997 study was carried out in March/April, in the rainy season, when tracks and signs may be regularly washed out and replaced.
2) During the cooler, drier season, Eland, Roan and Zebra, are believed to migrate off the plateau down into the warmer valleys- areas 2 and 3 (Johnson, 1990 p11). The 1998 study was undertaken in this cooler season, but not the 1997 study.
3) The grass is less lush in the cooler season, and burnt in some areas, enabling easier sighting of tracks and signs. Since our researchers studied a strip only 5m either side of their transect lines, this bias is likely to be small.

The total of all the scores in areas 2 & 3 in 1998 was 14% higher than in 1997. Biggest numerical increases were evident in signs of Bushpig, Mongoose and Buffalo and to a lesser extent, Bushbuck and Jackal. Also significant increases were seen in activity of Roan Antelope, Grysbok, Serval, Civet, Hyaena, Hare, Otter and Porcupine. Genet and Caracal are rarely seen and were pleasing additions to the list.

Despite this trend, significantly less activity was recorded for Kudu (-77%), Elephant (-42%), Baboon (-55%), Eland (-51%) and Reedbuck (-100%).

In 1998, signs of Elephant were lower overall, but were more widely distributed through Area 2, rather than Area 3.

For Elephant, the activity level for 1997 may have been artificially high. The results for Area 3 in 1997 were considerably scaled up to try and make them comparable to 1998 and therefore might be biased by "clumping" for large uncommon animals such as elephant, where the activity carried out in the three squares could have been unrepresentatively high.

The presence of signs of Elephant in only two squares to the east of Nganda Area suggest movement of elephant passing through, as was also indicated in the 1997 report. Repeating the study at the same time of year as in 1997 or 1998 will give a clearer picture.

Kudu was recorded in most of the squares in 1997, but in 1998 all signs were missing from the Mondwe Valley, and much reduced throughout. This raises concern.

The lower activity level of Eland is similarly of concern. The pattern of distribution remained constant over the two years, widespread through Area 2 and less so through Area 1. There are significantly fewer signs of activity throughout. This could not be explained by "clumping" or emigration to the plateau, because the widespread pattern of distribution is maintained over the two years. The lowered level of activity is of particular concern in the season when Eland should be at their most abundant in the valleys. This might indicate there has been a significant drop in the population.

Reedbuck was recorded in three out twelve squares of area 2&3 in 1997 but none in 1998. The one record from Area 3 was in a square that was studied in both years. Reedbuck in 1998 was only found in the squares closest to the plateau. Its disappearance from the lower valleys is of concern. Reedbuck are more common on at the higher altitudes, but disappearance from a peripheral habitat is frequently an indication of a diminishing or threatened population.

In 1997 signs of Baboon activity were widespread; they were found in all squares of Areas 2 and 3, but in 1998 Baboon was missing from the Mondwe and Chipome valleys of Area 2. Signs were found only in two most distant squares near Kawosya. Also a general decrease has occurred from Area 3.

Some populations were little recorded in both studies. Zebra were noted in only one square in 1998 and not at all in 1997, except on the plateau. If they did leave the plateau in June-July this year, it was not to go north. Red Forest Duiker scores very lowly and is confined to the montane forest patches. Leopards leave less prominent tracks and are not well recorded by this method.

The species that scored highest of all in both studies was the Common Duiker, which also showed a small (4%) increase between the two years, indicating a relatively stable population. The name Duiker comes from the Afrikaans for "diver" referring to its habit of bounding into hiding. It is known to survive well close to human habitation, protected from predators and able to hide from humans. A large duiker population could indicate a lack of predators. More work on the leopard populations would be useful.

6.6 CONCLUSION

There are bound to be natural fluctuations in populations, and possibly of preferred locations from one year to the next, which might be influenced by poaching activity or climatic fluctuations. Further study at the same time of year as either of the previous studies would indicate which of the changes are continuing trends.

No prints of young animals were noted. Presumably they were only just being born in the 1997 season and not yet very active. Further work on breeding success rates would be of great interest.

With all the information that we have now accumulated, both in the signs of poaching and in the changes in animal populations, it is clear that some large mammals are being influenced significantly by the heavy poaching pressure that is clearly evidenced by our work.

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7 POACHING REPORT

Grid Reference	Observations	Action
Week One		
975447	Poachers shelter sighted	Destroyed shelter
0142	Burnt grassland	
0241	Poachers' fire and snare	Snare confiscated
0443	Snares and tracks	Snares confiscated
9941	Burnt grassland and trails	
4195	Burnt grassland and trails	
015448	Footprints	
000469	Footprints	
981449	Poachers' rope	Confiscated
955469	Shelter	Destroyed
Week Two		
913559	Poachers drying rack, Eland bones	Destroyed
903571	Lookout point and camp	
863637	Camp	
869592	Camp, 2 poachers sighted leaving camp	Ranger gave chase, poachers lost in bush
864593	Poacher trail	
867592	Emerald pit dug near track	
901604	Poacher shelter	Destroyed
908572	Poacher beehive found	Destroyed
8663	Burnt grass and Eland carcass	
897567	Drying rack	Destroyed
928538	Fires sighted	
Week Three		
975586	Footprints	
975573 975801	64 snares along Sawi River	Removed
967597	Snares along Chezamo River from junction with Sawi	Removed
975573	Poachers shelter	Destroyed
944535	Poachers shelter	Destroyed
0159	Large hut	Left pending a future operation in area
0057	Poacher trail	
966546	Smoke spotted (bee smoking for honey)	Scouts investigated
975573	Leopard trap	Destroyed

8. SMALL MAMMAL SURVEY

Wilbert N. Chitaukali

8.1 ABSTRACT

The survey was conducted on fifteen days (from 13.07.1998 to 31.07.1998) at three distinct localities of the Nyika National Park: Nganda, Chipome and Sawi. Three sites at Nganda locality were revisited after the 1997 survey. A total of 87 specimens, representing 18 or 19 species of rodents, bats, insectivores, and macroscelids were collected. Out of the 18-19 found species, ten (*Epomophorus, Elephantulus, Steatomys*, *Saccostomus*, *Acomys, Tatera, Dendromus,* and three unidentified rodent species) are additional records to the 1997 survey results. Of these, *Steatomys* and *Saccostomus* (and the unidentified species?) are new records for Nyika in particular and for montane regions in general. Results of this study give clear evidence that the survey of the small mammals of the Nyika National Park has a long way to go.

8.2 INTRODUCTION

Small mammals (insectivores, bats, and rodents) constitute an important component of most terrestrial ecosystems. They form part of a food web, propagate and control some plants, are vectors and reservoirs of diseases, may affect soil structure; some species in some places rare also a source of food (source of protein) and income for humans. The spectrum and diversity of small mammals in a given area reflects its biogeographic history, its ecological value, and indicates its environmental conditions. The importance of the study of small mammals for understanding of ecology and environmental changes has been well recognised in Europe and North America (where the large mammal fauna is sparse) but it has been traditionally underestimated in Africa where zoologists tended to be particularly interested in large mammals.

A well documented flora and fauna of an area forms a basis for formulating policies as regards to their protection. In small mammals, more work, resources, time and expertise are required to establish a new species. This could be done in a well established laboratory through morphological (cranial and dentition), cytological, biochemical and molecular-biological characteristics. For this to be done, a representative study sample of 20 to 30 specimens have to be used. Removal of this number of specimens from a population poses no danger due to high population densities and fast regeneration capabilities.

Nyika National Park, despite its biogeographical importance, has been (due to its remoteness and inaccessibility) particularly understudied in terms of the small mammal composition. Our knowledge of the faunal spectrum is based on mostly incidental records. Only few studies (Overton & Nursaw 1972; Happold & Happold 1985; Burda & Chitaukali 1997) provide some basic data, enabling to assess and compare also some ecological quantitative parameteres (assessment of abundance, biodiversity indices, etc.). Even these studies were, however, limited in both space and time of collecting. Regarding the huge area of the Nyika National Park, its topographical and ecological diversification, it becomes clear that the previous study can be considered still only a pilot survey and many more further studies are needed.

8.3 STUDY AREA

The survey was conducted in three distinct localities, at which seven sites were sampled.

Locality 1: Around Nganda basecamp

Locality 1 was on the South-West Nganda slopes (S10.26, E 33.51, altitude about 2,291m). Temperatures were relatively low during day and chilly with heavy dew at night.

At this locality three sites were sampled:

Site 1: Along the stream on the eastern side of the base camp. This site has dark loamy soils, dominated by shrubs of about 1metre high and short grasses. Here trapping was done for two nights, 13/07/98 to 14/07/98.

Site 2: In the south-western direction of the base camp. Traps were set in the shrubs on the borders of the forest patch and the open grasses. This site has black compact loam soils. Trapping was done for three nights, 15/07/98 to 17/07/98.

Site 3: Was in the northern direction of the base camp, on the slopes of a hill. This site has thick ground cover of shrubs and grass of about 2 m. high Soils here are sandy-loam and rocky. Trapping was done for two nights, 18/07/98 to 19/07/98.

Locality 2: In the Chipome Valley Area 2

Locality 2 was in the *Brachystegia* woodland, (S10.20, E33.50, altitude about 1,531m). Temperatures were relatively high. At this locality, two sites were sampled.

Site 4: This site was dominated by tall grasses (about 2 m. high), with sparse *Brachystegia* trees. Ground cover was also sparse. The soils are from loose sandy, (close to the river), to compact red clay soils (away from the river into the woodlands). Trapping was done for two nights, 21/07/98 to 22/07/98.

Site 5: This site was along the Chipome riverbank and was covered by tall grasses and shrubs of about 1.5 m. high. It had thick ground cover. Soil texture ranges from loose sandy soils to compact red clay soils. Trapping was done for two nights, 23/07/98 to 24/07/98. A mist net for bats was also set at this site.

Locality 3: Along the Sawi River in Area 3

Locality 3 was at Bunthukwa Msisya village, S10.20, E33.53; altitude of about 1,500m). Two sites, 6 and 7 were sampled.

Site 6: Sampling at this site was done for two nights, 28/07/98 to 29/07/98. The transect went along the riverbanks of Sawi. It had loose soils, mainly loose sandy-loam to compact clay soils. Grasses of about 1 metre high and shrubs covered this area.

Site 7: The transect at this site went across *Brachystegia* woodland and then tall grasses of about 2m high. The ground was not well covered and had compact red clay soils. Trapping was done for two nights, 30/07/98 to 31/07/98.

8.4 METHODS

In all the three localities live traps (Sherman, Longworth and medium cage-traps) were set. Peanut butter, smeared on cardboard was used as bait. Traps were set in line transects at intervals of about 5 m. Baiting and checking for the catch was done late in the afternoon and in the morning. A mist-net for bats was set at suitable places. Searching and digging for mole rats was done during the day. Specimens collected were sacrificed (using diethyl-ether), weighed and standard mammalogical measurements were taken. Abdominal cavity was open and specimens were preserved in 70% alcohol as voucher specimens for further determination and taxonomic, anatomical and parasitological examination as well as for the examination of stomach contents.

The mole rat has been saved, and is kept alive in captivity for further taxonomical, physiological and behavioural study

8.5 RESULTS AND DISCUSSION

Total period used in setting the traps was 15 nights/days, i.e. 370 trap nights (number of traps ranged between 20 and 35 per night). Altogether 87 specimens were collected, representing 18 different genera with 18 or 19 different species of rodents, a shrew, a macroscelid, and a fruit bat (Table 1). Trapping success ranged between 0%, at site 7 locality 3, to 36 % at site 6 locality 3, the average being 18%.

Table 3: List of collected specimens

Genus	Number of species	Number of specimens	Locality	Collecting Method
Epomophorus	1	1	2	net
Crocidura	1	11	1, 2, 3	trap
Elephantulus	1	1	3	trap
Mus	1	14	1, 2, 3	trap
Acomys	1	14	2, 3	trap
Lophuromys	1	10	1	trap
Rhabdomys	1	8	1	trap
Tatera	1	7	2, 3	trap
Grammomys	1	6	1, 3	trap
Dendromus	1	3	1	trap
Graphiurus	1	2	1, 2	trap
Praomys/Hylomyscus/ Mastomys	1-2	2	1, 2	trap
Saccostomus	1	1	2	trap
Steatomys	1	1	2	digging
Heliophobius	1	1	1	digging
undeterm. sp. 1	1	2	1	trap
undeterm. sp. 2	1	1	2	trap
Undeterm. sp. 3	1	1	2	trap
Total	18-19	86	All 3	

The survey was conducted in three distant, topographically different localities at two different altitudes. It is apparent that factors such as altitude, soil, vegetation type, temperature, and precipitation affect the composition of species at different localities. Some species like *Mus* and *Crocidura* could be found at all altitudes (1,500-2,290m), while others like *Lophuromys* were found at higher altitudes (2,290m) only, and *Tatera* and *Acomys* occured at lower altitudes only (1,500m).

Locality 1: Nganda Base Camp

At locality one the commonly trapped mammals were *Rhabdomys* (striped mice)*, Crocidura, Lophuromys, Mus* and *Grammomys*. The striped mice were very common in the open grass areas and their distribution was limited to this habitat. These rodents were very active during daytime and were associated with the human habitation at the base camp. Out of the eight specimens trapped, only one was a female. No specimens of the striped mice were trapped at the lower altitudes. It was also observed that where occurred in abundance, no other rodents were recorded.

The *Crocidura* shrews were very common at site two, in the shrubs at the edge of a forest patch, where the soils were moist. They were encountered at all the altitudes. They appear to be active during both day and night.

Distribution of the *Lophuromys*, like that of the striped mice is limited. Specimens were collected only in the shrubs on the plateau. They are very common where they occur. The tiny mice, *Mus*, were very common in almost all the localities and at all the sites. These rodents, like the stripped mice were also associated with human habitation at our base camp.

At site 3, three specimens preliminarily identified as *Dendromus* were collected. They were not recorded in this area in 1997.

Locality 2: Chipome Valley

At locality 2, commonly trapped rodents were *Acomys* (spiny mice) and *Tatera*. The spiny mice were collected in places with loose sandy soils covered by grasses.

One specimen of *Steatomys* (fat mouse) was collected through digging at this locality. *Steatomys* has not been recorded from Nyika before. Moreover, Ansell & Dowsett (1988) considered *Steatomys* to be generally precluded from montane areas. The lack of any previous records may be accidental, as the fat mouse lives in burrow system of its own and the mounds may be mistaken for those of a mole-rat. Indeed, a burrow system uncovered by myself very much resembled that of a mole-rat, except that it was not so extensive. A burrow started with a mound and also had foraging tunnels, which ended up under roots of grasses. Only one specimen was found in the system.

At site 4 of this locality, *Saccostomus*, the pouched mouse, was collected. This species also represents a new record for Nyika. As in the case of *Steatomys*, this finding contradicts the statement by Ansell & Dowsett (1988) that *Saccostomus* is also absent from montane areas.

Locality 3: Along the Sawi Riverbanks

At locality 3, *Acomys* were the commonly caught rodents at site 6. No animals were trapped at site 7 on the last day. This could be due to openness of this area and also low plant diversity.

One burrow system of a mole rat, *Heliophobius*, was uncovered and mapped out at locality 1, site 1. In this survey a few more new records were collected, not only from the new localities but also from where we sampled during the 1997 survey. The appearance of more species could be due to the difference in the time of the year when the surveys were conducted. The increase in the area coverage may have also contributed to the increase in number of species.

It may be of interest to compare results of the previous surveys using the example of trappable murid rodents (family Muridae). In Table 6, genera of these rodents are listed which have been recorded in the Nyika area before 1988 (as based on the review by Ansell & Dowsett 1988 and considering results of the survey by Overton & Nursaw 1972) and in subsequent surveys. Recorded genera are marked by filled cells in the table.

The murid community can be roughly divided into three groups of genera: About one third of the genera are abundant and widely distributed in suitable habitats: *Mus, Grammomys, Rhabdomys, Lophuromys, Acomys, Tatera*. They can be recorded at any time (in respective habitats/altitudes) with relatively little trapping effort.

The other group encompasses murids which are less common, occur in lower densities and/or are selectively less trappable. This group includes *Dendromus*, *Aethomys*, *Zelotomys* and *Praomys*-like rats (*Praomys, Hylomyscus, Mastomys*). Although the latter were found in higher altitudes in both surveys, it has to be noted that taxonomy and identification of this complex is difficult and our specimens may represent different species/genera.

The third group consists of murids which can be denoted as rare (or rarely trappable?) and/or restricted to only quite specific habitats: *Otomys, Pelomys, Dasymys*, *Beamys, Mylomys,* and *Saccostomus*. While none of the first four named genera could be found in our 1997 and 1998 surveys, it has to be noted that each survey succeeded to identify at least one additional, previously unrecorded genus/species. Should the subsequent determination prove the (so far)

unidentified specimens as additional new records, the necessity of further surveys and potential for new discoveries in the Nyika area will be further stressed.

Table 4:Occurrence of different genera of small mammal in three periods of research

	Genus	Prior to 1988	1997	1998
1	Grammomys			
2	Rhabdomys			
3	Lophuromys			
4	Mus			
5	Hylomyscus / Praomys /Mastomys			
6	Aethomys			
7	Zelotomys			
8	Tatera			
9	Dendromus			
10	Acomys			
11	Otomys			
12	Beamys			
13	Pelomys			
14	Dasymys			
15	Mylomys			
16	Saccostomus			

8.6 ACKNOWLEDGEMENTS

I thank the organisers, Biosearch Nyika and Katumbu Challenge, through Peter Overton and Chris Nagle for inviting me to participate in the expedition.

The following team members assisted me in data collecting in the field; Mark Davis, Oliver Stead, Stephen Mayes, Ann Smeeth, William Taylor, Victoria Bain, Richard Hathway, Jeremy Osborne, Claudia Figg, Morgan Beanland, Adele Chuck, Peter Beaumont, and Gemma Sayer. The following scouts played a very important role in proving security in the field; Manfred Kumwenda (Chief Scout), Steven Gondwe, and Richard Nyirenda.

I also thank the Acting Director of Museums of Malawi and the Ministry of Education, Sports & Culture for allowing me to participate in this expedition. My thanks also go to the Director of the Department of National Parks & Wildlife for allowing us to work in the Park and the assistance rendered to us in the field.

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9 ENTOMOLOGY

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9.1 INTRODUCTION

The period July/August on the Nyika Plateau is normally very dry with night temperatures falling to freezing at the higher elevations and with large areas of burnt grassland, much of it indisciminately caused by animal poachers. The combination of these factors results in very low insect activity. Collecting at this time of year was not expected to be very productive. However, on entering the Park on 12th July, night-lamping with ultra-violet equipment was set up in the area of some unburnt grassland around a stand of *Acacia abyssinica* trees, approximately 20 km from Thazima gate at an altitude of 6200 ft. Despite only three hours of collecting due to a bright moon, a surprising 56 species of small moths were caught, of which at least 20 were not previously recorded from the Park.

When leaving the Nyika National Park on 25th July lamps were left on all night at the same spot as there was no moon, but on this occasion the grass had been burnt on one side of the road and only 10 species (one species additional to the earlier date's catch) were collected.

The impact of grassland fire on species abundance and thus the subsequent food chain would appear to be considerable.

Night lamping in the exposed, open, unburnt grassland at **Nganda** (2300m) resulted in only three species of moths over two nights.
At **Lake Kaulime**, at a similar altitude, which was partially burnt but had more shelter from trees, no moths were collected.
In *Brachtystegia* woodland near **Chisanga Falls** at 6000ft two moths were collected over two nights.
At **Kaperekezi Gate**, also in Brachystegia woodland and at 5200ft only a single moth was collected from three night's lamping.

Because of the very low numbers of night-flying insects it was decided not to carry lamping equipment into the Chipome and Mondwe River valleys.

Day collecting of Butterflies, Dragonflies, Bees, Wasps, Beetles, Bugs and Grasshoppers was conducted at Uledi (3200ft), Chipome/Mondwe valleys (5000ft), Kaperekezi Gate (5200ft), Chisanga Falls area (6000ft) and Nganda (7200-7600ft). species abundance was greatest at the lowest altitude but new Park records were taken at all altitudes.

One small Cetoniid beetle, *Leucocellis amoena*, is a new record for Malawi having only previously been found in the Chirinda forest, Zimbabwe. Two butterflies, *Tirumala formosa* and *Sallya umbrina*, are both new records for Malawi having not previously been recorded south of Tanzania. One *Chlorocypa* species of dragonfly appears to be undescribed and may be new to science.

9.2 RESULTS

Table 5: Number of species collected

Clasification	No. of Species	New records
Small moths	63	22
Butterflies	50	16
Bees/Wasps	41	20 subject to confirmation
Grasshoppers	24	10 subject to confirmation
Beetles	7	5
Bugs	5	4
Flies	1	1
Dragonflies	23	12
Total	214	90

9.3 INSECT SPECIES LIST

The list that follows includes all the species identified on the two expeditions in 1997 and 1998. There are also a few additions contributed from work outside the expeditions which makes this the most comprehensive published list availbable for the Nyika National Park. Those species added in 1998 are asterisked. There is inevitably a large number of specimens awaiting identification. Further information will be published in due course with a complete checklist of insect species to have been found to date in the Nyika National Park.
BMNH = British Museum Natural History; NMK = National Museum Kenya.

RHOPALOCERA (Butterflies)-*New records for the Park*

Family Acraeidae
Acraea alalonga Henning 1996
Acraea cabria Hopffer 1855
Acraea leucopyga Aurivillius 1904
Hylalites (Auracraea) parei orangica Henning 1996

Family Danainae
**Amauris crawshayi crawshayi* Butler 1897
**Tirumala formosa formosa* Godman 1880

Family Hesperiidae
Acada biseriatus Mabille 1898
Celaenorrhinus handmani Berger
Coeliades pisistratus Fabricius 1793
Kedestes callicles Hewitson 1868
Kedestes limalina
Sarangesa astrigera Butler 1893
Teniorhinus harona Westwood 1881

Family Lycaenidae
Alaena nyassae major Oberthur 1888
Aldeides conradsi angoniensis Tite & Dickson 1968
Anthene lunulata Trimen 1894
Axiocerces nyika Quickleberg 1984
Axiocerces tjoane tjoane Wallengren 1857
Azanus jesous Guerin 1847
Cacyreus lingeus Stoll 1782
**Deudorix kafuensis* Neave 1910
Epamera violacae Riley 1928
Hypolycaena buxtoni Hewitson 1874
Iolaus silanus silanus Grose Smith 1889
Lachnocnema bibulus Fabricius 1793
Leptotes pirithous pirithous Linnaeus 1767
Mimacraea marshalli marshalli Trimen 1898
Pentilla tropicalis Boisduval 1847

	**Tuxentius ertli (aurivellius)* 1907
Family Nymphalidae	*Charaxes castor flavifaciatus* Butler 1895
	Charaxes fione Henning 1977
	Charaxes nichetes leoninus Butler 1895
	Charaxes protoclea azota Hewitson 1877
	Byblia anvatara achloia Wallengren 1857
	Eurytela dryope angulata Autivillius 1898
	Junonia antilope Feisthamel 1850
	Junonia archesia Cramer 1779
	Junonia artaxia Hewitson 1864
	Junonia terea elgiva Hewitson 1864
	**Junonia touhilimasa* Vuillot 1892
	Junonia natalica Felder 1860
	**Salamis anacardii nebulosa* Trimen 1881
	**Salamis Parkassus* (Drury*) 1782*
	Sallya boiosduvali boisduvali Wallengren 1857
	**Sallya umbrina* (Karsch) 1892
Family Papilionidae	*Graphium leonidas leonidas* Fabricius 1793
Family Pieridae	*Belenois creona severina* Stoll 1781
	**Belenois aurota aurota* Fabricius 1793
	Colotis antevippe gavisa Wallengren 1857
	**Colotis dissociatus* Butler 1897
	Colotis eris eris Klug 1829
	Colotis euippe omphale Godart 1819
	Colotis evenina casta Gerstaecker 1871
	**Eurema mandarinula* Holland 1892
	Mylothris agathina agathina Cramer 1779
	**Nepheronia thalassina sinalata* Suffert 1904
	**Pinacopteryx eriphia eriphia* Godart 1819
Family Riodinidae	**Abisara dewitzi* Aurivillius 1898
Family Satyridae	**Aphysoneura pigmentaria obnubila* Riley 1923
	**Bicyclus cooksoni* (Druce) 1905
	Bicyclus cottrelli Van Son 1952
	Henotesia simonsii Butler 1877
	Melanitis leda helena Westwood
	Melanitis lybia Distant 1882
	Psyscaeneura pione Godman 1880

HETEROCERA (Moths)

Family Agaristidae	*Crameria amabilis* Drury 1773	
	Ovios septentrionis Hampson	
	Pseudopais nigrobasalis Bart	
	Teurta rema Druce	
	**Secusio doriae* (Oberthur) 1880	Nyctomerinae
Family Arctiidae	*Amerila bubo* Walker 1855	
	Argina amanda Boisduval 1847	
	Diacrisia sulphurea Butler	
	Macrosia chalybeata Hampson	
	Seriarctia metaxantha Hampson 1909	
	Spilosoma lutescens Walker	

	Spilosoma scioana Oberthur	
Family Cossidae	*Azygophleb coffea* Aurivillius	
	Sp. near *Eulophonotus obesus* Karsch	
Family Geometridae	*Argyrophora trophonia* Cramer	Ennominae
	Chiasmia JUNIOR OFFICERhnstoni	"
	Chiasmia rectistraria Herrich Schaeffer	"
	Cleora sp.	"
	Cophophlebia olivata Warren 1894	"
	Epigynopterix maeviaria Guenee	"
	Nopia flexilinea Warren	"
	**Semiothisa subcurvaria* Mabile 1897	"
	**Xylopteryx interposita* Warren	"
	**Zamarada dentigera* Warren 1909	"
	**Zamerada glareosa* Bastelberger 1909	"
	Psilocera pulverosa Hampson	
	Taeda gemmans Felder	
	**Chlorosterrha semialba* Swinhoe	Geometrinae
	**Pingasa abyssinaria* (Guenee) 1857	"
	**Asthenotricha dentatissima* Warren 1899	Larentiinae
	**Larentia sublesta* Prout	"
	**Mimoclysta annulifera* Warren	"
Family Hepialidae	**Gorgopsis abbottii* Holland	
	**Gorgopsis caffra* Walker	
Family Lasiocampidae		
	**Bombycopsis indecora* Walker 1865	
	**Dipluriella songeana* Strand	
Family Limacodidae	*Lembropteris neglecta* Her	
	Omocena dolmani Westwood	
	Susicina pyrocausta Hampson	
Family Lymantridae	*Agyrostagma niobe* Weymer	
	Aroa discalis Walker	
	Barlowia sp.	
	Bracharoa ap.	
	Dasychira sp.	
	Dasychira curvivigrata Karsch	
	Hyaloperina erythroma Coll	
	Laelia bifascia Hampson	
	Laelia fracta Sch & Clem	
	Leucoperina impucta Butler	
	Psalis pennatula Felder	
	Rhypopteryx rhodalipha Felder	
	Stilpnaroma venosa Hering	
Family Noctuidae	*Amyna punctum* F	Acontiinae
	Ozarba megaplaga Hampson	"
	Ozarba sp.	"
	**Ozarba heliastis* (Hampson) 1902	"
	Amphridina sp.	Acronictinae
	Callopistria maillardi Guenee	"
	Callopistria yerburii Butler 1884	"
	Namangana castaneotincta Hampson	"
	Spodoptera littoralis Boisduval	"
	Micragrotis sp.	Agrotinae
	Busseola fusca Hampson 1910	Amplipurinae
	Tathorhynchus plumbea	"

	Caranilla angularis Boisduval 1883	Catocalinae
Family Noctuidae	*Cyligramma latona* Cramer	"
	Heliophysma croceipennis Walker 1857	"
	Mocis repanda Felder	"
	Mocis undata Felder	"
	Sphingomorpha monteironis Butler	"
	Ulothrichopus hardyi Clifton	"
	**Metaretia lateritia Herrich-Schaffer*	Ctenuchinae
	**Thyretes negus* Wallengren	"
	Cuculia ochribasis Gaede	Cuculiinae
	Eutelia leucographia Hampson	Eutellinae
	Borolia tacuna Felder	Hadeninae
	Borolia uncinatus Gaede	"
	Cirphis prominenus Walker	"
	Dicerogastra lampra Karsch	"
	Meliana sp. near *tenebra* Hampson	"
	Nyodes sp.	"
	Polia speyeria Felder & Rogenhofer	"
	Rougeotia praetexta Townsend	"
	Heliothis armigera Hubner	Heliothinae
	Heliothis xanthia Walker	"
	Masalia sp. Walker	
	Bomolocha potamistis Hampson	Hypeninae
	Agrotis segatum Dennis & Schiffermuller	Noctuidae
	Amazonides sp.	"
	Agrotis sp. near *contiguens* Warren	"
	Euxootera sp.	"
	Mentaxya atritegulata	"
	Thria robusta Walker	"
	Anticarsia irrorata Fabricius	Ophiderinae
	Anomis flava Felder	"
	Anomis sobulifera Guenee 1852	"
	C*alpe emarginata* Fabricius	"
	Maxera nigriceps Walker 1858	*"*
	*Plusioc*alpe sp.	Ophiderinae
	Rhandiphora cinctigutta Walker	"
	Serrodes partita Fabricius 1775	
	Chrysodeixis acuta Walker 1857	Plusiinae
	Plusia limbiralea Guenee	"
	**Syngrapha circumflexa* (Linnaeus) 1767	"
	Tricaplusia orichalcea Fabricius 1775	"
	Blenina albifascia Pinney	Sarrothripinae
	Blenina squamifera Wallengren	"
	Chasmina tibialis Fabricius	
	Phalerodes cauta Hampson	
Family Notodontidae	*Cerura esmeralda* Hampson	
	Desmeocraera thalassina Hampson	
	Diastemina simplex Walker 1855	
	Polienus albescens Gaede	
	Scalmicauda bicolorata Gaede	
	Scalmicauda tessmanni Strand	
Family Pterophoridae	**Acipitilia candidalis* (Walker) 1864	
Family Pyralidae	*Ampulalonia sp.* Crambinae	
	Ancylomia sp. Crambinae	
	Bocchoris impersalis Zeller	
	Calamochrous flavimarginalis Hampson	
	Eurrhyparodes confusalis Warren	

	Filodes costivitialis Guenee
Family Pyralidae	*Lokostega venustalis* Cramer
	Marasmia sp.
	Maruca vitiata Fabricius
	Marvitzia centiguttalis Gaede
	Pagyda traducalis Zeller
	Palpita unionalis Hubner
	Panotima angustalis Hampson
	Pilocrocis dichocrosialis Hampson
	Pyrausta incoloralis Hampson
	Spoladea recurvalis Fabricius
	Syllepte ovalis Walker
	Syngamia convulsa Meyrick
	Tschnurges lancinalis Guenee
Family Saturniidae	*Epiphora imperator* Stoneham 1933
	Gonimbrasia rectalineata Sonthonnax 1899
	Nudaurelia macrops Rebel 1917
	Ubaena dolabella Druce 1886
Family Sesiidae	*Adixoana sp*
Family Sphingidae	*Acherontia atropus* Linnaeus 1758
	Agrius convolvuli Linnaeus
	Basiothia medea Fabricius 1791
	Coelonia mauritii Butler 1876
	Euchloron megaera Linnaeus 1758
	Hippotion celerio Linnaeus
	Hippotion eson Cramer 1779
	Hippotion osiris Dalman 1823
	Leptoclanis pulchra Rothschild & Jordan 1903
	Macroglossom trochilus Hubner 1823
	Nephele comma Hopffer 1857
	Polyptychus coryndoni Rothschild & Jordan 1903
	Rhodafra marshalli Rothschild & Jordan 1903
	Temnora elegans polia Rothschild 1904

COLEOPTERA (Beetles)

Family Buprestidae	*Hoplistura disjuncta* F	
	Psiloptera albomarginata Herbst	
	Sterapsis amplennis Fahreus	
	Sternacoa orissa variabilis Kerremans 1886	
Family Cantharidae	*Lycus murrayi* Bourg	Lycinae
	Lycus sp.	"
	Lycus sp.	"
Family Carabidae	*Cypholoba graphipteroides* Guer	Anthiinae
	Eccoptoptera cupricollis Chandois	"
	Eccoptoptera sp.	"
	Thermophilum burchelli maculatum Sternb	"
	Psecadius obertheuri Gestro	Panagaeninae
	Scarites senegalensis Dej	Scaritinae
	Sterestoma stuhlmanni Kolbe	Pterostichinae
Family Cerambycidae	*Callichroma leucorhapnis* Gerst	
	Ceroplesis thunbergi F	
	Oligomerus limbalis Har	

Family Cetoniidae	**Leucocelis amoena* Peringuey 1907	Cetoniinae
Family Cetoniidae	*Chondrorrhina picturata* Harold 1878	
	Cosmiophaenia rubescens Brancsik 1914	
	Daedycorrhina bidenticornis Allard 1985	
	Gnathocera cruda sub sp. nova	
Family Chrysomelidae	*Bradlema neavei* Heinze	Criocerinae
	Chrysomela saegeri Burgeon 1941	Chrysomelinae
Family Cleridae	*Dieropsis 4 maculatus	
Family Coccinellidae	*Epilachna dregei* Mulsant	Epilachninae
	Lioadalia intermedia Crotch	Coccinellinae
	**Epilachna ardiosiaca* Sic	
Family Curculionidae	*Amphitmetus sp.*	
	Dicasticus sp.	
Family Eumolpidae	*Corynodes sp.*	
	**Corynodes dejeani* Bertol	
Family Galerucidae	*Idacantha conifera* Fairm	
Family Lagriinae	*Lagria villosa* F	
Family Meloidae	*Coryna katonensis* Pic	Meloinae
	Mylabris holosericea Klug	"
	Mylabris tristigma Gerst	"
	Mylabris sp.	"
	Decatoma sobrina Per	Zonitinae
	Zonitoschema eborina Fahr	"
Family Melonthinae	*Euphoresia sp.* (not in BMNH or NMK)	
Family Melyridae	*Melyris nigripes* Hav	Dasytinae
	**Melyris atricornis* Champ.	
Family Prionceridae	*Idgia dimidiata* var. tripartita Pic	
Family Scarabaeidae	*Anachalcos procerus* Gerstaecker	
	Catharsius mossambicmus Ferreira	Coprinae
	Catharsius satyrus Kolbe	"
	Copris amyntor Klug	"
	Copris mesacanthus Harold	"
	Heliocopris hamifer Harold	"
	Onthophagus cribripennis D'Orbingney	Onthophaginae
	Onthophagus parumnotatus Fahraeus	"
	Onthophagus sp.	"
	Proagoderus biarmatus D'Orbingney	Proagoderinae
	Proagoderus brucei Reiche	"
	Proagoderus dudleyi Cambefort	"
	Garreta malleolus Kolbe	"
	Popillia browni Kolbe	Rutelinae
Family Staphylinidae	Sp. near *Hasmus ertli* Brnk	
	Philonthus sp.	
Family Sylphidae	Species not found in BMNH or NMK	
Family Tenebrionidae	*Distretus variabilis* Glb	

Family Trogidae	*Trox nyansanus* Haaf	
	Trox caffer liliana Scholtz	

HYMENOPTERA (Bees and Wasps)

Family Anthophoridae	*Amegilla torrida* Sm	Anthrophorinae
	Anthophora acraensis F	"
	Mesotrichia sp.	"
	Mesotrichia sp.	"
	Xylocopa corinata Sm	Xylocopinae
	Xylocopa flavobicincta Grib	"
	**Xylocopa nigrita* F.	
Family Brachonidae	*Serraulax decemmaculatus* Szepligeti 1911	Brachoninae
Family Eumenidae	*Ancistrocerus lineaticollis* Cam	Eumeninae
	Eumenes maxillosus De Gear	"
	Odynerus ardens var junodi Gribodo 1895	"
	Odynerus radialis Sauss 1854	"
	Odynerus ventralis Sauss	"
Family Ichneumonidae	*Netelia sp.*	
	(all spp. in BMNH not named)	Euryophininae
	**Asprynchotus gueinzii* (Tasch)	
Family Megachilidae	*Megachile sp.*	Megachilinae
	**Chalicodoma bombiformis* Gerst	
Family Pompilidae	*Anoplius fuscus*	Pepsinae
	Cyphononyx sp.	"
	Cyphononyx sp.	"
	Cyphononyx sp.	"
	Hemipepsis dedjas Guer	"
	Hemipepsis imperialis Smith	"
	Hemipepsis ochropus Stal	"
	Hemipepsis tamisieri Guer	"
Family Scoliidae	*Megameris labilis* Schulz 1906	
	Scolia morio Fab	
Family Sphecoidea	*Ammophila beniniensis* (Pal de B)	Sphecinae
	Ammophila punctaticeps (Arn)	"
	Sceliphron spirifex L	"
	Chalybion laevigatum Kohl	Ampulicinae
Family Vespidae	*Belognaster dubius* Kohl	Epiponinae
	Belognaster fascialis du Buysson 1906	"
	Belognaster griseus F	"
	Belognaster vasseae du Buysson 1906	"

DIPTERA (Flies)

Bombylius sp.	Bombyliinae
Bromophila caffra Macq	Platystomatidae
Dejeania bombylans Fabr	Tachnidae
Exoprosopa magnipennis Bz	Anthracinae
Litorhina allothyris Bz	"
Lamyra gulo Lw	Laphriinae
Mydidae sp.	Bombyliinae

	Senapsis dibapha Walker	Eristalinae

ODONATA (Dragonflies)

Family Aeshnida	**Anax separatus* Hagen 1867	
	**Hemianax ephipigger* (Burmeister) 1839	
	**Orthetrum julia falsum* Longfield 1955	
	**Trithemis annulata* (Beauvois) 1805	
	**Trithemis arteriorosa* (Burmeister) 1839	
	**Trthemis werneri* Ris 1912	
Family Agriidae	**Phaon iridipennis* (Burmeister) 1839	
Family Chlorocyphidae	**Chlorocypha consueta* (Karsh) 1899	
Family Lestidae	**Chlorolestes conspicua* Selys	
	**Lestes pallidus* Rambur 1842	
Family Libellulidae	*Tramea basilaris* Palisot de Beauvios	
	**Crocothemis sanguinolenta* (Burmeister) 1839	
	**Pantala flavescens* Fabricius 1798	
Family Protoneuridae		
	**Chlorocnemis marshalli marshalli* Ris 1921	

ORTHOPTERA (Grasshoppers)

Family Acrididae	*Gastromargus africanus* Saussure	Oedipodinae
	Gastromargus sp.	"
	Trilophidia sp.	"
Family Mantidae	*Metentella mervensis* Sj	Amelinae
Family Pyrgomorphidae		
	Maura bolivari Kirby 1902	
Family Tettigoniidae	*Ruspolia vicinus* Walker	Copiphorinae
	Enyaliopsis sp.	Heterodinae
	Zabalius orientalis Karsch	Pseudophyllinae

Note: 17 other species of Orthoptera indeterminate due to immaturity.

NEUROPTERA (Lacewings/Ant lions)

	Thesibasis lacerata Hag	Ascalaphidae
	Acanthoclisis lineatipennis Per	Myrmeleontidae
	Formicaleon roseus Fraser	"
	Hagenomyia lenthifer Walker	"
	Palpares sparsus Mclach	"
	*Silveria marshall i*Mq	Psychopsidae

HETEROPTERA (Bugs)

Family Coreoidae	*Anoplocnemis dallasiana* L & S	Coreidae
	Latimbus sp. L & S	
	Plectronemia sp. L & S	

Family Pentatomoidae		
	Atelocera attenuata Dist	Pentatominae
	Dismegistus sp. Dist	Pentatominae
	Nazara viridula var torquata Fabr	Pentatominae
	Dalsira sp.	Phyllosephalinae
Family Reduviidae	*Rhinocoris erythrocnemis* Germ	Harpactorinae
	Rhinocoris sp.	"
	Rhinocoris sp.	"
	Cosmolestes sp.	

9.4 CONCLUSION

The results, when compared with the previous work (Malawi 1997), demonstrate the importance of collecting throughout the year to achieve the fullest possible inventory of species for the Nyika National Park. Because of its large range of habitats included in an altitudinal span of over 1800m this Park is likely to hold the greatest species diverstiy of any of Malawi's protected areas. More than 500 square kilometres in the north of the Park have yet to be fully explored, either entomologically or otherwise, and further collecting will undoubtedly substantially increase the number of known species.

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10. BOTANY

Hassam Patel & Marianne Overton

10.1 INTRODUCTION

This survey was aimed at establishing quantitative data to illustrate the diversity and abundance of plant species in each of six areas in the northern hills of the Nyika National Park. In 1972 only twenty 1m quadrats were assessed in the base camp meadow area and five on a burnt ridge to the northeast of Nganda. However, useful detailed descriptions of the flora were given. (Wye College Report 1973) In 1997, sixty seven 3x3m quadrats were assessed, divided over ten locations, in the same valley areas here described as Areas 1-3. The associations of common species for each habitat type in each area were described.

This extensive study of six areas, uses about 40 quadrats in each area, sized 5mx5m. The vegetation of the most distant areas of the Sawi and Guwu valleys are also quantitatively assessed with some accuracy for the first time. The plant associations in each area are described.

The work was carried out by members of the Southampton Officer Training Corps under the leadership of Hassam Patel of the National Herbarium of Malawi.

10.2 SURVEY AREAS

The topographical areas of this northern region of the Nyika National Park were previously described by J A Hargreaves (Wye College Report 1973). As described in 6.6 of this report three main areas (Areas 1-3) were selected for survey. The botanical survey covers two locations within each survey area. The areas are described in 6.6.

Locations 1 and 2 correspond with the part of "NE Nganda" studied in 1972 and 1987(Catchment Areas B and C), but is at the edge of the Area 1.Location 1 is north-east of Nganda (Catchment C) and Location 2 is just south-east of Nganda (Catchment B).

Locations 3 and 4 are in the Area 2. More specifically, location 3 is described as the Chipome/Kawozya/Jalawe area and location 4 as the John Zhyambo deserted village area and surrounds.

Locations 5 and 6 are in Area 3. Location 5 is in the Guwu Valley and Location 6 in the adjacent Sawi Valley.

10.3 METHOD

Qualitative data was collected throughout. Samples of plants were taken as appropriate, carefully prepared in plant presses, with sheets changed and dried daily. These specimens add to reference collections in Herbaria and are particularly useful when taken from unusual locations, as this indicates the range of forms that can be seen as one species. Extreme forms are most likely to be found in geographically isolated locations, such as the Nyika Plateau and mountain tops. (For example, an extreme form of *Indigo patula* was found in 1997.) The specimens were checked and lodged at the National Herbarium and Botanical Gardens at Zomba.

Quantitative data is useful to demonstrate changes in plant populations over time, perhaps as a result of burning, changes in grazing populations or changes in the annual rainfall.

Table 6: Number of quadrats studied in each area

Location	Number of quadrats
1 Area 1 Northeast Nganda	35
2 Area 1 Southeast Nganda	21
3 Area 2 Chipome/Kawozya/Jalawe	33
4 Area 2 John Zhyambo	40
5 Area 3 Guwu Valley	28
6 Area 4 Sawi Valley	40
Total	197

It was noted in 1997, that the 3x3m quadrat tended to miss some common species and more work was needed to establish the most appropriate size of quadrat. This survey team tried out 10x10m in Area 1, but found this unwieldy and compromised with a 5x5m quadrat size in all areas, repeated 20 to 40 times in each survey area, until a representative sample was achieved.

The list of species found in each of 197 quadrats was submitted by Hassam Patel. All the data was analysed by Biosearch Nyika in the UK. The species names were checked by Dr R. Brummitt, of Kew Herbarium.

10.4 RESULTS

Botanical Collections

The botanical list of specimens checked and lodged in the National Herbarium at Zomba is given in Table 7.

In total, 98 different specimens were collected. Some are likely to be confirmed as new records for Malawi, a few at Genus level, (not included here) and some at species level. Further work is in progress. As the fieldwork was during the cooler, drier season this year, specimen collection was limited by the shrivelled condition of many plants, and by the lack of flowers or fruits in some cases. However, collecting in different seasons increases the overall number of species in the reference collections. These will be also be a valuable teaching resource.

Relative Abundance

The most common species in each location tend to characterise an area. Species which occur most commonly in each area are shown in Table 8.

The relative abundance of each species in each area is illustrated as a percentage in Table 9. For each location, the total number of times each species appears in quadrats is calculated as a percentage and shown in the table. Where no record is given, it was not found in any quadrats in that location. Plants with no quadrat entries are those that were not found in any quadrats, being collected randomly and later identified at Zomba. Grasses are under-recorded in the quadrats and areas cannot be reliably compared. *Brachystegia* percentage tree cover may also be under-recorded, where the canopy overlaps other vegetation. The overall species list shown in Table 9 includes all the qualitative data from 1998 and is complete.

The lists of species overall from 1997 were compared in detail with that from 1998. The number of different species recorded in the two studies of 1998 and 1997 are shown in Table 10.

Table 10: Number of species found in 1997 and 1998

Number of species found in both years	Number of species found only in 1997	1998	Total
445	312	389	1146

47% of species found in 1998 were different from those found in 1997. These are specifically identified in Table 9. 312 out of 758 species found in 1997, that is, 41% could not be found in 1998.

This shows the value of repeating the survey in different seasons. In some cases a whole Genus was present in one season, but absent in another. For example *Oxalis (2sp)., Scilla (1sp.), Bulbostilis (6sp.),* and *Conyza (9 sp.)* were only recorded in the wet season.

Some genera were more poorly recorded in the dry season, in particular the grasses, such as *Panicum sp.* 13 species of *Panicum* were identified in the wet season, but only three in the dry season, including one that was new.

More data was collected from the Sawi and Guwu valleys in 1998 than in 1997, and this may account for some of the increase in number of species found. For example four new species of *Buchnera* were found, but only in the lower two valleys. However, among the new records there is no clear bias towards occurrence in the lower valleys. Species new to 1998 were found more or less equally in all areas.

10.5 CONCLUSIONS

We have highlighted yet again the abundance of different plant species in this remote part of the National Park. The time period between the Expedition and the publication of the report is not sufficient to make definitive statements about undescribed species or variants. That will follow in due course. However, we are now well underway with an ecological map of this area and have indicated that there is good expectation of further new discoveries if this work is continued to cover all months of the year. The number of different species (47%) in 1998 from those identified in 1997 illustrates this point well. There are of course many remote valleys in the northern Park which have not yet been studied at all. With the considerable diversity of collected species in areas quite close to each other and at apparently similar biogeographical sites, it would seem to suggest that further exploration into these areas could be very fruitful.

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11 FINANCIAL REPORT

Steve Mayes,

11.1 INTRODUCTION

The expedition finances were held in the SUOTC account through the adjutant. JUO Mayes kept records of all expedition funds. Sufficient funds were required in the account at key dates in order to pay for flights and other costs before the expedition departure date. This meant that payment of individual contributions was staggered to meet these dates and to spread the burden of payment. The majority of the expedition cost was covered by personal contribution from the members. The initial cost of £1400 per person was significantly reduced by financial support from the University of Southampton, the Ulysses Trust and other sources to £1100. A breakdown of expedition income is given below.

11.2 FUND RAISING

In order to reduce the cost to the expedition members methods of obtaining extra funds were considered from the start. Woman Officer Cadets Sayer and Smeeth wrote to many major companies with details of the expedition and requests for support. These were all, without exception, unsuccessful due to the companies either having policies of not supporting such small expeditions or already being committed to supporting larger scale projects or charities.

The major contributor to the expedition was the University of Southampton. An application was made to the Roy Queer Bequest (through Dr RJ Green the Senior Assistant Registrar) was successful and was the largest single contribution. Other successful applications were made to Southampton University Students Union, the University of Southampton Society, Bournemouth University and the Ulysses Trust.

On an individual basis some expedition members wrote to local charitable trusts and had some success in obtaining funds to put towards their contribution. Details of these trusts were found in local libraries.

11.2 EXPEDITION INCOME:

Item	Total
Personal Contributions	£14,695
University of Southampton (Roy Quere Bequest)	£2,250
Ulysses Trust	£880
Southampton University Students Union	£200
University of Southampton Society	£100
Bournemouth University	£100
CILOR (rate £2.97)	£1,385
Other sponsorship	£600
TOTAL INCOME	£20,210

All available funds were taken with the advance party in travellers cheques (pounds sterling) The main party brought all remaining funds in travellers cheques together with US$ cash for the airport departure tax. The aim was to keep a reserve of funds to cover post expedition costs and unexpected costs. A breakdown of the expedition costs is given below:

11.3 EXPEDITION EXPENDITURE:

Item	Total
Flight deposit	£350
Flights full	£7,849
Insurance	£446
Biosearch Nyika	£9,800
Airport tax (14 @ $20)	£175
Food*	£1,375
Communications*	£10
Hardware*	£50
Miscellanious[1]	£155
TOTAL EXPENDITURE	£20,210

* closest amount in pounds sterling converted from Malawi Kwatcha (at a rate of £1 = Mk42)
[1] miscellaneous items includes extra medical kit items, expedition badges, Expedition Report costs and reserve funds.

The main costs before the expedition departed were paid to Biosearch Nyika (£700 pp). This paid for transport, accommodation, organisation and permissions in Malawi (this obviated the need for a recce), contributed to the costs associated with Malawian staff and included the R & R programme. In addition the contribution covered organisational and briefing work before the expedition and managing, writing and editing work for report production after the expedition, including the continuation of international liaison for maintenance of the project in future years.

The expedition ran well within financial constraints and the limited reserve funds were available for expedition report costs and to purchase some equipment for future expeditions.

12 FOOD REPORT

Steve Mayes & Pete Beaumont

12.1 INTRODUCTION

The planning and purchase of the bulk of expedition food was the responsibility of JUO Beaumont and JUO Mayes during the advance party. Food was required for three periods of the trekking each of six days duration and for the time in base camp between these. In total the food was planned for twenty-five days in the field for eighteen people. Some time was spent initially looking around the shops in Lilongwe to check on cost and availability of various produce. A six-day menu was then written with estimated servings per person for each item. This was then totalled and the goods purchased.

12.2 MEALS

Breakfast
Limited choice, cereals were available but these were perishable and expensive. Pro-nutro, granola and instant oats were taken instead. Pro-nutro was not a favourite due to its texture and more sugar would have been good for energy in the morning.

Lunches
Tinned fish (Sardines or Pilchards), peanuts, raisins and biscuits with jam or peanut butter. Individuals also had personal snacks.

Dinners
These were based around the staples of rice and pasta.

MENU 1	MENU 2	MENU 3	MENU 4	MENU 5
Rice	Pasta	Pasta	Rice	Rice
Corned Beef	Tuna	Tomato Puree	Bean Curry	Ham
Tomato Puree	Beans	Beans	White Sauce	Tomato Puree
Onion	Tomato Puree			
	Onion			

The beans were local dried beans that required soaking for several hours before boiling to become edible. Sachets of soup were also taken, as were herbs, spices, salt and pepper to add to sauces though the tomato puree was an excellent base. Excess rice was often made into rice pudding. More consideration would have been taken on the amount of tinned food had the trip involved more sustained trekking without the camps.

Base Camp Meals
The resupply runs were made prior to the groups returning to base camp. This allowed fresh rations to be available. Fresh rations were used where possible; fresh meat, bread, eggs and vegetables. Breakfast was usually scrambled eggs on toast; lunch was jam bread and soup; dinner was a stew of potatoes, cabbage and meat. This was a welcome break from the trail food. The resupplies allowed any deficiencies in the original food supplies to be compensated for.

Drinks and Sundries
Herbs, spices, salt and pepper were all useful but the local Peri Peri hot chilli sauce was often used to spice food. Small containers for cooking oil on treks would have been useful for frying and putting in pasta and cooking oil.

Hot drinks at breakfast and after supper were tea, Milo and coffee. Milk powder was used for drinks and breakfast as well as for rice pudding. Sugar was used in large amounts in drinks and breakfast and was a good source of energy. The group used 15-kg of sugar, but more would have been useful.

12.3 PREPARATION AND COOKING

Trangias were taken on the treks and paraffin stoves were used at base camp, but were slow for the amount of food being cooked and they were little used. The most effective way to cook was on wood fires. Cooking was generally done in teams unless they were all together in one camp. The numbers in each group varied according to whom was working with the scientists. The food for each six-day trek was handed out during the day at base camp and split down into ziplock bags where possible. Peanut butter came in plastic jars. These were useful for storing the tinned jam so that it could be used over a couple of days.

12.4 RATIONS FOR THE TREKS

The following ration list was suitable for 15 personnel spending 25 days in the field.

Quantity	Description	Serving per person
40 Tins	Tomato Puree	100g tin per team
25 Tins	Corned Beef	1/3 Tin
20 Tins	Luncheon Meat	1/3 Tin

30 Tins	Tuna	½ Tin
30 Kg	Rice	½ Cup
12 Kg	Pasta	½ Cup / 100g
2 Kg	Beans	50g
10 Kg	Onions	½
40 Pots	Peanut Butter	½ per team per day
40 Tins	Jam	½ per team per day
140 Packets	Biscuits	
75 Tins	Pilchards	½ Tin
75 Tins	Sardines	½ Tin
20 Bags	Peanuts	½ per team per day
15 Bags	Raisins	½ per team per day
50 Boxes	Pro Nutro Breakfast Cereal	
50 Boxes	Oats	
50 Boxes	Granola Cereal	
40 Sachets	Soup	
1.5 Kg	Coffee	
800	Tea Bags	
3 Kg	Milo	
15 Kg	Sugar	
15 Kg	Milk Powder	
2 Kg	Salt	
3 Litres	Oil	
180	Eggs	30 eggs per meal
12 Kg	Meat	2 Kg per meal
60 Loaves	Bread	4 loaves per meal

12.5 CONCLUSION

It was found that milk and sugar were rationed too tightly. In a cold and active environment it is recommended that future expeditions purchase 30-50% more of these commodities than estimates predict. The morale effect of sufficient, verses inadequate, sugar is significant.

13 MEDICAL REPORT

Adele Chuck

13.1 INTRODUCTION

The medical kit for this expedition was supplied through Marchwood Medical Depot with kind assistance from Sergeant Thake. The kits proved to be more than adequate whilst being of a small size.

Following a traveller's health brief supplied by the London School of Hygiene and Tropical Medicine, the expedition members ensured that they had the following vaccinations: Polio, Tetanus, Typhoid fever, Hepatitis 'A', TB and Diphtheria. Rabies, Hepatitis 'B' and Yellow fever were considered optional. These vaccinations were obtained by individuals and were funded by Land Command.

Malaria prophylaxis was required, with the recommended regime being Mefloquine.

The overall health of the team was good throughout the expedition with the only injuries being a self-inflicted penknife wound to the thumb, which was dealt with using Steristrips, and a twisted ankle which healed after a few days rest. The major risks were considered to be:

mosquitoes, stomach upsets due to contaminated water and food, sunstroke, dehydration and lower leg injuries.

Mosquitoes proved not to be a problem at the altitude at which we were living. A high level of good hygiene and precautionary measures meant that stomach upsets were avoided. It is important to set up a routine of all the team members washing hands before preparing and eating food, each using a small amount of separate clean water. Water purification was carried out using chlorine or iodine tablets. At base camp, many members chose not to treat the water and did not suffer any ill effects. The effect of the sun was strong at the high altitude; hats were a necessity. It was also important to ensure adequate water was consumed by everyone to prevent dehydration. Lower leg injuries could have been a serious issue as the casualty would have had to have been carried out, at least to base camp. Such injuries should be minimal if individuals are sensible and careful.

13.2 MEDICAL KIT LIST

Item	Quantity
Bandaid strip 6 cm x 30 cm	2
Dumbel sutures	20
Zinc oxide tape 2.5cm x 5 m	3
Micropore tape	6
Bandage 10 cm x 4.5 m crepe	6
Bandage , elastic adhesive	3
Triangular bandage (compressed)	6
Dressing Melolin gauze squares - large	20
- small	20
Dressing burn hand plastic bag with adhesive fastening	6
Dressing, first aid, field, sterile 20 x 19 cm	6
Paranet (Parafin gauze) 10 x 10 cm	5
Eye pads	6
Savlon dry spray	3 cans
Dioralyte	40 sachets
Ibuprofen 400 mg tablet	50
Paracetamol 500 mg tablet	100
Soluble aspirin 300 mg tablet	80
Burn exe spray	3 can
Wound cleaner (hydrogen peroxide)	3 bottles
Lomotil	440 tablets
Mycota	4 tubes
Normasol (sterile liquid)	50 sachets
Triludan	3 x 60
Brabasol	3 x 20
Gentisone HC (ear drops)	6 x 10ml
Calamine lotion	1 x 200 ml
Hydrocortisone cream	6 tubes
Airway, pharyngeal, quedel, plastic, disposable, size 3	3
Needles (0.8 x 40 mm)	15
Syringe 2 ml	4
Medi swab	100
Canesten	3
Thermometer	3
Tweezers	3
Scissors	3
Safety pins	1 packet
Rubber gloves	

The above items were divided into 3 mobile kits to fit into small bumbags.

13.3 PERSONAL FIRST AID KIT

A personal first aid kit consisting of the following items was also recommended:

- Zinc oxide tape
- Multi vitamins
- Suncream factor 20
- Lip salve
- Sore throat sweets
- After bite stick
- Moisturiser.

In addition, individuals were recommended to get a course of the antibiotic Ciprofloxacin from their GP, which is used to treat serious cases of diarrhoea.

14 EQUIPMENT

Pete Beaumont

14.1 INTRODUCTION

A requisition was submitted to Thatcham adventure training stores several months prior to the start of the expedition. Due to the fact that SUOTC is a low priority unit very little of the requested kit was issued. This meant that the expedition members had to use personal kit or borrow from others to obtain all the required items.

14.2 TREKKING EQUIPMENT

Some of the main items of kit are listed below, a full kit list is given at the end.

Tents
All of the tents that were taken were adequate for the conditions. The only damage was due to some miserable low-life ants eating one of the finest tents (owned by the author!).

Sleeping Bags
The nights at base camp were very cold, and some mornings produced a frost, therefore a good three or four season sleeping bag was required. In the lower valleys the nights were warmer, which was nice.
Team members used fabric and leather boots for the trekking and both types performed well.

Clothing
Due to the nights being cold fleeces were essential. Windproof fleeces are better, with the cold winds at night at base camp. Waterproofs were not really necessary, as there was only a little drizzle. Lightweight but tough walking trousers were needed, as was a hat.

Rucksacks
These needed to be large enough to carry all the kit as well as food for the week. About 70 litres was adequate.

Stoves
Trangia stoves were taken on the treks as they were all that was available. Lightweight multi-fuel stoves would have been better though it did not matter as the stoves were rarely used.

14.3 WATER

All water on the plateau was considered suspect. A water purification unit was too expensive to buy and could not be obtained any other way. This left the alternatives of boiling and the use of iodine/chlorine. Bottles of tincture of iodine were taken for group use. This was the cheapest method of purification and was effective, though it is not recommended for trips of longer duration.

14.4 BASE CAMP STORES

The advance party in Lilongwe bought many of the stores for the base camp. This included: twin paraffin burner, wire, string, paraffin, meths, lantern, pots (4 simple local ~5 litre pots bought in the market, wire used to make handles), hessian (screen around the long drop), toilet paper, buckets (carrying water from stream to camp), wash basins, soap, cutting knife, large serving spoons. A pick-up truck load of wooden poles were supplied from Chelinda and were used to build various structures; a tripod to hang pots over the fire; a table, which was essential for keeping food off the ground; a bench and a tepee shelter, (using an old parachute and groundsheet brought from England) in which we could leave excess kit during the hiking stages. We had no spare tent. The set up at base camp was minimal but worked for the short time spent there. Items that would have been useful are spreading knifes - and concrete for a track down the hill to the camp and waterfall!

14.5 MAPS

The maps of the Nganda area were obtained from the Department of Maps and Surveys offices in Lilongwe and Mzuzu as well as through Captain Tembo. The maps used had a scale of 1:50 000 with a vertical interval of 50 ft (Series Z742(DOS425) Sheet 1033B4). The 1st edition maps (1971) from Captain Tembo had the old settlements and trails marked which were abandoned when the Park was extended. This was useful as the scouts knew these names and could relate the map to the ground more easily. The more recent 2nd edition maps (1985) purchased from the dept. of maps and surveys did not have these marked but were still adequate.

14.6 GPS

One GPS was taken but in the lower valleys had difficulty getting sufficient satellite signals. The grid references that it gave were also suspect. The teams relied on the maps and the scout's knowledge of the area.

14.7 PERSONAL KIT LIST

This list includes only that which was actually used on expedition.

Item	Qty	Item	Qty
Film 36 exposures 200 ASA	3	Jungle Formula insect repellent	1
Camera	1	Aspirin packet	1
Ziplock bags large	5	Savlon Dry spray	1
Diary	1	Sun cream & moisturiser	1
Disposable single blade razors	2	Shave gel	1
Swimming goggles (Lake Malawi)	1	Tooth brush (extra just in case)	2
Fuel bottle	1	Dubbin for boots	1
Camera case	1	Pan scourer pad	1
Mini binoculars	1	Stuff sacks	2
Lipsalve	1	Foot powder	1
Washing bowl (fits in bottom of pack)	1	Sterile wound pads	4
Wet wipes medium size pack	1	Deodorant	1
Head torch	1	Bag of sweets (large)	2
Spreading knife	1	Flannel	1
Wooden spoon	1	Large towel	1
Shorts pair	1	Inflatable pillow	1
Pants pair	2	Thermarest mattress	1
Trousers pair	1	Pocket knife (Swiss Army, leatherman)	1
Walking socks pair	2	Battery sets (torch, GPS etc.)	3
Travel wash for clothes	1	Book	2
Shower gel (for hair and body)	1	Waterproof pens	2
Fabric plaster strip	1	Duct tape roll	¼
Zinc oxide tape roll	1	Sewing kit	1
Toilet roll	1	Nylon para-cord	2m
Lighter (click light style best in wet)	1	Pan Holder	1
Sandals	1	Compass	2
Light shoes/moccasins	1	Good quality waterproof walking boots	1
T shirts	2	Sweatshirt	1
Fleece jacket	1	Sweatpants	1
Drink flavouring powder	10	Hat broad-brimmed	1
Scrubbing brush	1	Soap-on-a-rope	1
Waterproof jacket	1	Gloves	1
Long sleeved shirt	2	Tent	1
Soap dish	1	3 season sleeping bag	1

15 MOUNTAIN LEADER REPORT

Richard Hathaway
4 Kings Own Royal Border Regiment

Climate
Nyika at the time we visited (July/August) was not dissimilar to conditions encountered in the hills of England. The group needs to be equipped for chilly nights and mornings, as temperatures dropped to 2°C. Sleeping bags need to be appropriate. A fleece liner in a summer season bag would work well.

Clothing
Expeditioners should bring long sleeve tops for protection against insect bites and the tropical sun.

Cooking
Trangia stoves worked well and meths was easy to buy in Mzuzu. Most of the cooking was done on open fires. A selection of smaller pots with lids should be brought for this purpose, rather than using the expensive Trangia pans. Pans need handles or Trangia pan-holders (two) to remove them from the fire.

Terrain
The terrain was challenging underfoot. Stout footwear is strongly recommended. Leather boots are more durable. Expeditioners should ensure that their boots will last the whole trip. It is not practical to buy replacements even if they are available in Lilongwe, which is unlikely.

Safety near Fires
Though sandals were very popular during the evening, people should be aware of the risk of harming their feet when near a fire or when cooking. Badly blistered feet due to a scald would result in a serious incident from such an easily avoided cause. If you are cooking or near the fire, boots should be worn.

First Aid
The remoteness of the Park will have a big attraction for future expeditions. Because of the lack of roads, a casevac would have serious difficulties. People leading expeditions to Nyika need to have a higher standard of first aid training than say for the UK. A training day out on the hills in England should be used to familiarise people with emergency procedures and explain first-aid kits.

Navigation
Maps of the area were very good. The scouts have an excellent working knowledge of the Park and generally navigate well. It proved valuable to check the navigation regularly, as sometimes mistakes were made. Expedition members should be given plenty of practise in map work, Nyika itself being an ideal training ground.

16 COMMUNICATION REPORT

Mark Davis

16.1 INTRODUCTION

Radios were taken on the expedition for two main reasons. Firstly they would enable groups to operate flexible routines in the remote areas of the Park, with base camp being able to track their movements. Secondly, any casevac could be executed more efficiently with contact between groups and outside agencies.

16.2 RADIO SELECTION

The undulating nature of the terrain and the large separation between stations meant that the high frequency waveband would have to be used.This narrowed that selection to the PRC320 manpack set. Hand generators with small batteries were procured enabling extended operation for relatively low weight. Three sets were taken to Malawi. Whip antennas were used for the patrols and a dipole for the base camp set.

16.3 IMPORT/EXPORT DOCUMENTATION

On investigation it transpired that a DTI Temporary Export Licence was require to take the equipment out of the country. This documentation takes at least 6 weeks to process. The paperwork was sent in and the day before departure, a note was received, rejecting the application and requesting more information. The decision was made to take the radios regardless. On arrival at Gatwick, the sets were taken to the Customs post. The decisive piece of documentation which enabled export to happen without any hitch was a letter from the Malawi High Commission in London stating that we were permitted to take PRC 320's into Malawi. In Malawi, the customs officials had been primed by Peter Overton and the Advance Party complete with copies of the authorisation letters. The officials were curious but helpful. This experience was repeated on the way out, though it would have been better to declare the radios to customs at Lilongwe, rather than be called to explain what the heavy green boxes were in our baggage.

16.4 FREQUENCIES, CALLSIGNS AND SCHEDULED BROADCASTS

The frequencies were 'borrowed' from the Nyika Safari Company (NSC) who had a selection of civilian nets. NSC were willing to act as the primary contact in case of casevac. It was felt that they had a very professionalset-up both in Lilongwe and Nyika and were best placed to assist us.The groups devised their own callsigns for entertainment value (Scoobie Doo, Jungle Book and Toy Story). A test of the available frequencies was done with stations sent 1-2 km from base camp. From this test, optimum frequencies were selected with the broadest possible frequency range. In the event of no contact, groups were to switch frequency every 15 minutes until the supply was used up. Scheduled broadcasts were at 07:00 and 19:00 daily. Upon loss of communications, teams were to be back in base camp 72 hours later. This plan reflected the lack of confidence in the communications system but allowed the teams to achieve the maximum activity possible, should communications fail.

16.5 OPERATION

Communications were lost immediately. Much experimentation with antennae failed to achieve contact with the groups or any outside agency. A message sent to one group resulted in fleeting communications success one morning on a frequency clos to the VHF band. At the three-day point, the base camp radio was dispatched to the highest peak in the area where

contact was made. This option was not a satisfactory solution to the problem because the peak was remote and it was still impossible to talk to NSC in Chelinda. One last-ditch attempt was made to work with NSC. A radio was taken to Chelinda where a lot of fiddling with side bands was done with no success. The radios were simply incompatible.

16.6 CONCLUSION

The decision was taken to abandon the use of the PRC 320's for this expedition. The base camp was moved to the centre of the survey areas and plans set to co-ordinate any emergency through the expedition leaders. Fortunately, this plan was never put into action. One team signaller was heard to say, "The radios were not so much a communication tool, more a very large and very heavy green seat!"

17 PHOTOGRAPHY

Oliver Stead

All members of the expedition had instant cameras and a couple of SLR cameras were taken. In order to protect the cameras most people had padded pouches for them. The light conditions were generally good and 200 ASA film was adequate. For the game reserves 200mm focal length lenses on the SLR cameras gave the best pictures of distant animals. Due to these being viewed at dusk a 400 ASA film was more suitable. Because of the high ultra violet input, especially at base camp altitude, a proper UV filter is recommended in preference to a 'Skylight'.

18 CONTACTS

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ACKNOWLEDGEMENTS

UNITED KINGDOM

The Royal Geographical Society for financial sponsorship of Biosearch Nyika and Mrs Shane Winser at the Expeditionary Advisory Service for recommending the successful partnership between SUOTC and Biosearch Nyika.

University of Southampton, Roy Queree Bequest
Contributed a very generous £2,250

Ulysses Trust
Contributed £880 to the expedition funds

Colonel Harrison, 4th Division
Help and advice on the rocky road through approvals

Wilderness Expertise Ltd.
Advice, equipment, and insurance

Major Gardener, 4 Kings Own Royal Border Regiment
Enabling Richard Hathaway to attend the expedition as our capable, popular and intrepid Mountain Leader

Dr R. Brummitt, Kew Gardens
Advice and assistance with the botanical work

GERMANY

Professor Hynek Burda, University of Essen, Germany.
Assistance and advice with the small mammal work

MALAWI

Mr Masida Gondwe, Regional Officer for the northern region of the Department of National Parks and Wildlife in Mzuzu

Messrs Manda (Park Manager) and Mpepo (Scientific Officer) at Nyika
Support and encouragement for the continuation of the project

Mr Moyo, Senior Wildlife Officer at Chelinda
Logistical support before and during the expedition

The Director and staff of the National Herbarium of Malawi at Zomba for taxonomy work on specimens after the expedition

Dr M Nhlane, Director of the Museums of Malawi
Permission and support for the small mammal project

David and Robyn Foot, Nyika Safari Company
Field support especially with communications

Georg Kloeble of the Tuma Forest Reserve, Malawi
Advice and help for strategic development of project work