Biodiversity Express Survey

The Njesi Plateau expedition, Niassa, Mozambique

November 2016

Biodiversity Inventory for Conservation

Biodiversity Express Survey 6.3

Biodiversity Express Survey (BES) 6.3, The Njesi Plateau expedition, Niassa, Mozambique
November 2016
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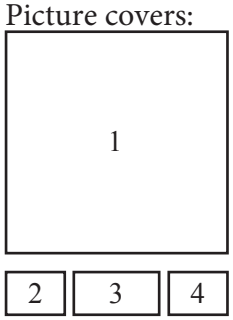

1. Aerial view of the slopes of Mt Chitagal (Picture: Mac Stone)
2. *Artisornis moreaui* (Picture: Mac Stone)
3. *Hyperolius* sp. (Picture: Justin Clause)
4. *Chameleo dilepis* (Picture: Justin Clause)

Biodiversity Express Surveys (BES) are snapshot biodiversity studies of carefully selected regions. Expeditions typically target understudied and/or threatened areas with an urgent need for more information on the occurring fauna and flora. The results are presented in an Express Report that is made publicly available online for anybody to use and can be found at www.BINCO.eu. Teams consist of a small number of international specialists and local scientists. Results presented in Express Reports are dynamic and will be updated as new information on identifications from the survey become available.

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EXPEDITION FACT SHEET

Location

Three peaks in the Serra Jecci Mountain range (Niassa, Mozambique) were visited:

1. Chitagal - Basecamp at an elevation of 1428m (12°35'49.32"S 35°15'46.74"E).
2. Sanga - Basecamp at an elevation of 1702m (12°23'0.72"S 35°20'6.96"E).
3. Njesi Plateau - Basecamp at an elevation of 1728m (12°49'56.76"S 35°11'12.00"E).

Time in the field

5th- 25th November (21 days)

Expedition Members

Clause, Justin	Herpetologist (USA)
Geeraert, Lore	Entomologist (Belgium)
Jamie, Gabriel	Ornithologist (UK)
Jocque, Merlijn, Dr.	Entomologist/Herpetologist (Expedition leader) (Belgium)
Jones, Sam	Ornithologist (Expedition leader) (UK)
Niesten, Pim	Filmmaker (Belgium)
Patel, Hassam	Botanist (Malawi)
Stone, Mac	Wildlife Photographer (USA)
Sumbane, Emidio	Ornithologist (Mozambique)
van Berkel, Tim	Mammalogist (Netherlands)
Amasse, Tuaibo	Camp manager (Mozambique)
Amide, Tomas	Guide (Mozambique)
Buanar, Basidio	Ranger Bravia (Mozambique)

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WWF

Acknowledgements

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We are grateful to the following individuals for providing further resources and informative discussions on various aspects of the expedition throughout planning; Jay McCentee, Lincoln Fishpool, Daniel Portik, Shane Winser, Neville Shulman, Nigel Collar and Colin Congdon. We would also like to thank Gary Allport and Tracie Parker for their encouragement, advice, hospitality and for facilitating many interesting discussions during our time in Mozambique. We would also like to thank Oliver Burdekin at burdGIS for his help producing GIS material for the final report.

For permitting procedures, we would like to thank the Natural History Museum in Maputo, especially Lucillia Chuquela and Erica Tovela for their help with the application process and collaboration. Special thanks are also due to Gabriela Bittencourt and Hermenegildo Matimele for their help in the earlier stages of the permitting process. In Lichinga we are indebted to Pedro Vicente, Simao Manuel and Basidio Buanar from Serviços Provinciais de Florestas e Fauna Bravia for help with obtaining the permits, and further to Basidio Buanar for his excellent and professional support in the field.

As the expedition leaders (Merlijn Jocque and Sam Jones), we would like to take this opportunity to thank all members of the expedition field team for their universal good nature, hard work and willingness for personal sacrifices that made the whole venture a smooth and affable operation under challenging field conditions. Of particular mention here are Tuaibo Amasse our cook and camp manager, Tomas Amide, Chequini Jiassimtus and Sabadiomar our guides, all critical members of this expedition that warrant more thanks than this short mention here affords. While there are too many to individually name here, we also thank the 70+ porters that carried over 500kg of equipment up and down the three mountains. Our gratitude extends to the local communities in the vicinity for granting us access to the mountains and hospitality during transit.

In the aftermath of the expedition, we would like to thank the following people for their help with identification of the material collected; Rudy Jocqué (spiders), Rosser Garrison (dragonflies), Simon Loader (amphibians), Harith Farooq (amphibians and reptiles), Rainer Hutterer (small mammals).

This expedition was supported by the Critical Ecosystem Partnership Fund (Afromontane Hotspots fund), Royal Geographical Society (with IBG) with a Neville Shulman Challenge Award, The Rift Valley Corporation and World Wildlife Fund Belgium. The Critical Ecosystem Partnership Fund is a joint initiative of l'Agence Française de Développement, Conservation International, the European Union, the Global Environment Facility, the Government of Japan, MacArthur Foundation and the World Bank. A fundamental goal is to ensure that civil society is engaged in biodiversity conservation.

Summary

The mountains of northern Mozambique - archipelagos of scattered inselbergs topped with evergreen forests - remain poorly known biologically. Their long geological isolation from the east African rift combined with the conflict-fractured history of Mozambique meant that while they represent an area of clear biological interest they have been subject to very little biological research until recent years. Most recent efforts have focused on the mountains in north-central Mozambique such as Mts Mabu and Namuli, highlighting their unique biological value through landmark discoveries of previously undocumented montane forests and multiple new species to science. Results from this work indicate that Mozambique's mountains may be distinct biogeographically from those to the north or west but also highlighted the need for further exploratory work elsewhere in Mozambique's mountains. Large highland areas in Niassa, north-western Mozambique still remain virtually unexplored, however. We sought to address this biological knowledge gap by undertaking a rapid multi-disciplinary biological inventorying expedition of the Njesi Plateau, Mt Chitagal and Mt Sanga, three distinct highland peaks that harbour 'Afromontane' habitats of likely high biological value in Niassa province. Specifically, we aimed to compile as much information on the biological assemblages of flora and fauna present of the mountains in order to understand their conservation value.

We undertook fieldwork at study sites on each peak between 5-25 November with the specific aim of crossing the dry-wet season divide. We sampled intensively for the following taxonomic groups- birds, mammals, amphibians, reptiles, botany and selected invertebrate groups.

The initial results of our field surveys yielded valuable discoveries across taxonomic groups comprising of multiple range extensions (including species previously unrecorded in Mozambique), the presence of highly threatened species and several invertebrate species new to science. We also conducted specific target work on the Long-billed Tailorbird (*Artisornis moreaui*), an endangered bird known only from these mountains and the Usambara mountains in north-eastern Tanzania, but which few ornithologists have ever seen (in Mozambique). We are pleased to report its relative abundance here as well as documenting the presence of several avian range extentions, most notably Dapplethroat (*Modulatrix orostruthus)*. Mammal surveys yielded at least two significant range extensions, including the Smith's Red Rock Hare (*Pronolagus rupestris)* and Syke`s monkey (*Cercopithecus albogularis)* as did amphibian and reptile surveys (including the second recorded locality for (*Cordylus meculae)*, although the full results of the latter are awaiting more analytical work. Some invertebrate groups still require identification but spiders and dragonflies revealed several new species to science (7 from the 37 spider species recorded) and 2 new country records from 12 dragonfly species. Botanical records are not presented in this report because collected material is still awaiting full confirmations on identification.

The findings from this expedition illustrate the biological value and conservation importance of these little-known highlands. By extension, they further evidence the biological and conservation value of Mozambique's mountains and the critical importance for their sustainable management. Our results will feed directly into the biodiversity component of a project coordinated by the Rift Valley Corporation in the region aiming to sustainably manage Niassa's native woodland and forests.

The Njesi Plateau expedition; A biological assessment of Mt Chitagal, Mt Sanga and the Njesi Plateau in Niassa Province, Mozambique

Introduction

The mountains of the East African Rift, stretching south from Ethiopia to Mozambique, are known to harbour rich biological diversity owing to their unique habitats and long periods of isolation. Typically comprising of evergreen montane forests interspersed with high altitude grassland/moorland habitats, these montane archipelagos, often volcanic in origin, have been widely documented to support high levels of endemism across taxonomic groups and are of international conservation value (Myers et al. 2000). Taken together, these unique habitat types and species assemblages represent the distinctive 'Afromontane' ecotype. While certain mountain ranges within this region have been relatively well studied biologically (e.g. the Eastern Arc Mountains of Tanzania (Burgess et al. 2007)), gaps in our knowledge remain (Critical Ecosystem Partnership Fund 2011). One of the most substantial areas remaining poorly known biologically are the mountains of northern Mozambique, that sit adjacent to the main highlands of eastern Africa running south/south-west through Tanzania and through Malawi. Several early colonial explorers undertook collecting work in Mozambiques mountains during the late 19th and early 20th century, such as Jack Vincent on Mt Namuli (e.g. see Vincent 1933a, 1933b) and while it is not the purpose of this introduction to review this, comprehensive accounts of the colonial exploratory history of Mozambique's mountains can be found in Timberlake et al. (2009) and Timberlake et al. (2012). Despite these early explorations, there followed a long period with little biological research in the region owing partly to the Mozambican civil war that raged in the country until the mid-1990s. Indeed, even until relatively recently access was still limited in parts of the country due to the threat of land-mines.

Since the early 2000's, significant exploratory work addressing the knowledge-gaps in biological information in Mozambique's mountains has been undertaken. This initial series of expeditions on Mozambique's mountains, largely funded by the UK's Darwin Initiative, yielded many discoveries. Of particular note was the landmark discovery of Mt Mabu, the largest mid-altitude rainforest in southern Africa (affectionately named the "Google forest" after its discovery via Google Earth) (Bayliss et al. 2014). Several new species to science were described as a result of these expeditions, for example, five new Chameleons (Branch & Tolley 2010; Branch et al. 2014), the forest viper *Atheris mabuensis* (Branch & Bayliss 2009) and the bat *Rhinolophus mabuensis* (Taylor et al. 2012). Despite the increased international attention on Mozambique's mountains, they still remain poorly known, with thorough biological survey efforts limited to certain mountains and certain taxanomic groups. Among the better studied groups have been the avifauna, diurnal lepidoptera, plants and herpetofauna, particularly (but not exclusively) on Mts Namuli, Mabu, Inago and Chiperone (see Bayliss et al. 2014; Bayliss et al. 2010; Congdon et al. 2010; Dowsett-Lemaire 2010; Dowsett-Lemaire & Dowsett 2009; Dowsett-Lemaire 2008; Fishpool & Bayliss 2010; Harris et al. 2011; Oatley & Tinley 1989; Portik et al. 2013; Ryan et al. 1999; Spottiswoode et al. 2008; Timberlake et al. 2007; Timberlake et al. 2009 & Timberlake et al. 2012). As a result of this increased survey effort, the conservation significance of Mozambique's highlands has been widely acknowledged, both due to their importance in holding substantial populations of many highly

threatened Afromontane taxa (e.g. Spottiswoode et al. 2008) and that Mozambique's mountains might represent a distinct eco-region to that of other highlands to the north and west because of their unique species assemblages (Bayliss et al. 2014). The northernmost highlands and mountains of Mozambique remain particularly poorly studied however, and consequently there are few biological surveys from which comparative information is available to assess the limits of this purported ecoregion.

One of the key highland areas in the north-west of the country is situated in Niassa province (Fig 1), incorporating the Njesi Plateau (Serra Jecci/Lichinga plateau), Mt Chitagal and Mt Sanga, north of the provincial capital of Lichinga. These mountains have received little to no biological attention despite their likely biological significance and highland links to the north. To this end, we sought to better understand the biodiversity of these mountains by conducting a biological inventory on all major floral and faunal taxonomic groups. Our expedition directly meets urgent calls made in the literature for a biological assessment to be undertaken here and the region in general (see Collar & Stuart 1988; Parker 2001; Spottiswoode et al. 2008 & Stattersfield et al. 1988).

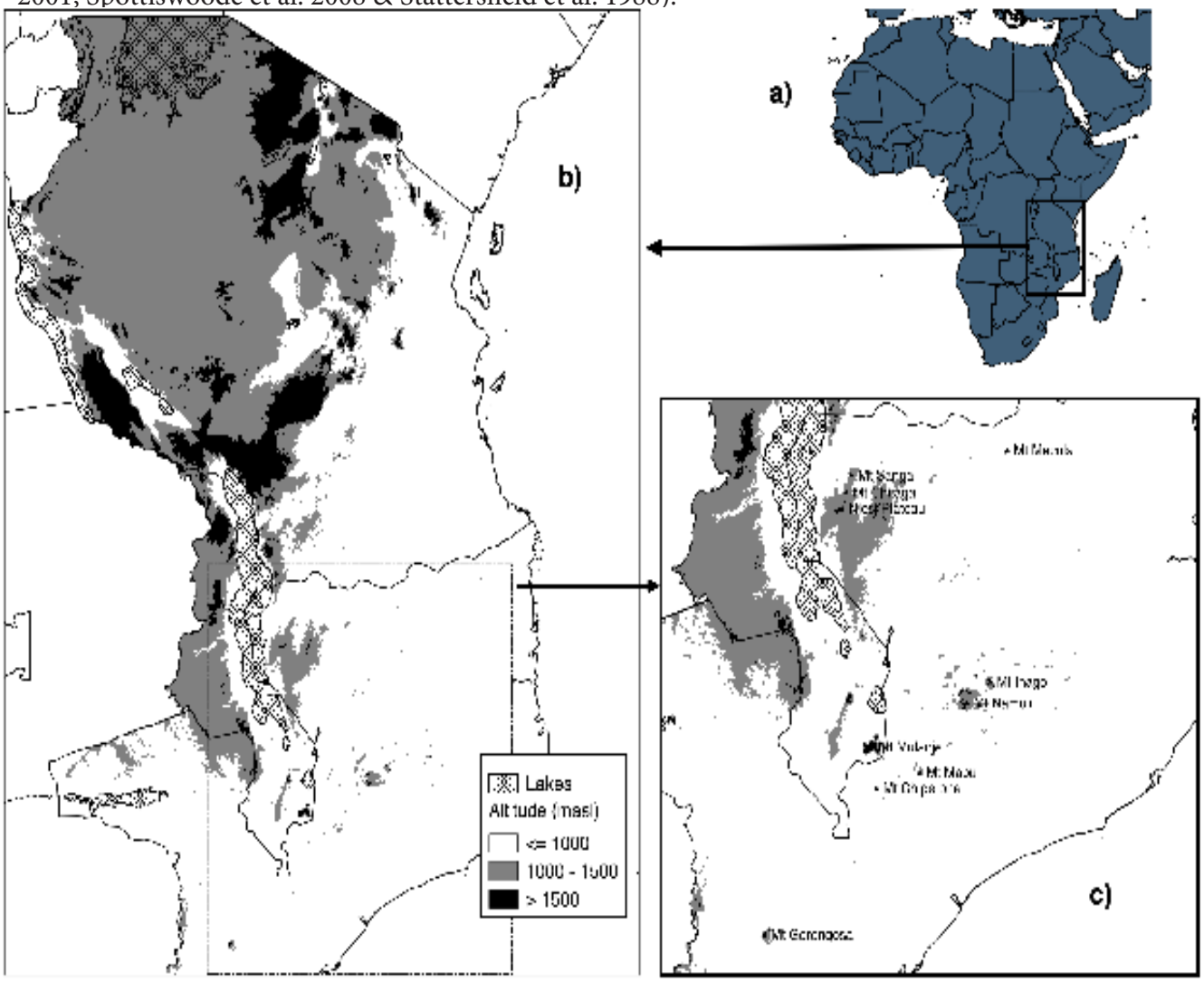

Figure 1. Maps showing a) the relative position of the south-east African highlands on the African continent, b) a topographic profile of the highlands of Tanzania, Mozambique and Malawi, illustrating the disjunct mountains of north and north-central Mozambique from the main highlands further north and west and c) the locations of specific north and north-central Mozambiques mountains. The mountains highlighted are those that have been subject to much of the biological assessment work referred to throughout.

Previous exploratory work on the Njesi Plateau/Serra Jecci

To date, the Njesi Plateau region has been visited by scientists on four occasions, the majority of which have focussed on the main plateau to the south. The foothills of Mt Chitagal have been visited for a short period on one previous occasion whilst Mt Sanga has never been scientifically surveyed. A summary table (Table 1) of previous visits is provided below including published material.

Table 1. Summary of previous survey efforts on the Njesi Plateau and Mt Chitagal. Mt Sanga has seen no previous survey effort that we are aware of.

Researchers/collectors	Dates	Taxon focus	Reference
Jali Makawa	1945 (?)	Birds	Benson (1945, 1946)
P. Ryan & C. Spottiswoode	3-5 July 2001	Birds	Ryan & Spottiswoode (2003)
J.Bayliss, C.Congdon, H. Patel	February 2009 (3 days)	Butterflies	Congdon et al. (2010)
D. Portik, E.A Mulungu, D. Sequeira, J. McEntee	29 July- 5 August 2011	Herpetofauna/Birds	Portik et al. (2013)

The first work conducted in the region was by Jali Makawa, in 1945, who collected bird skins on behalf of the ornithologist, Constantine Walker Benson. This initial work was important for its discovery of a population of Long-billed Tailorbird *Artisornis moreaui*, a species known only from this isolated mountain range and from the East Usambara mountains in northern Tanzania. The population was subsequently described as a different subspecies (*sousae*) (Benson 1945). The specific location of this visit is not clear, but is presumed to be between the main Njesi Plateau and the base of Mt Chitagal. The second visit was motivated by the tailorbird, the presence of which was confirmed by Ryan & Spottiswoode (2003) during a 3 day visit to the foot of Mt Chitagal in 2001. The third (Congdon et al. 2010) was undertaken as part of the Darwin Initiative funded explorations of Mozambiques Afro-montane hotspots. This trip was to the southerly tip of the Njesi Plateau and focussed on collecting butterflies where an apparently undescribed species of *Charaxes* butterfly was discovered. Finally, the most recent visit focussing on herpetofauna and birds was undertaken in 2011. An annotated checklist of the herpetological findings has been published (Portik et al. 2013), but no findings are yet available on avifaunal observations. The Long-billed Tailorbird was reported to be common, however, and apparently few species were encountered that differed from that of the preliminary checklist published by Ryan & Spottiswoode (2003) (J.McEntee pers comm.).

A map of the relative position of the Njesi Plateau, Mt Chitagal and Mt Sanga to one another and to the provincial capital of Lichinga is displayed in Fig 2.

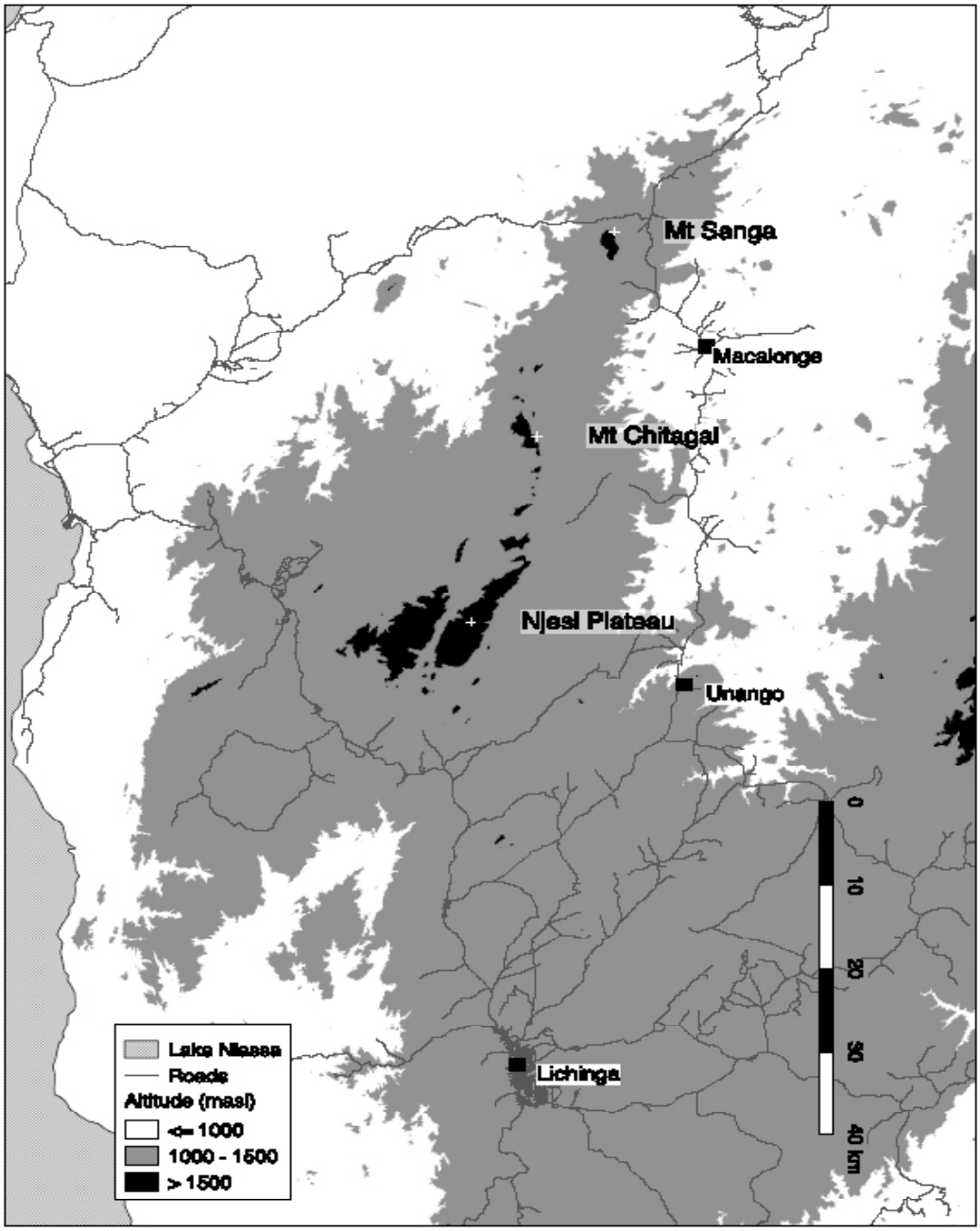

Figure 2. Topographic map showing the relative location of the three surveyed highlands of this expedition- Mt Sanga, Mt Chitagal and the Njesi plateau- to one another. In addition, the relative position of the provincial capital of Lichinga is shown as well as general road access in the region. The broader location of these mountains relative to others in Mozambique can be seen in Fig 1 (c).

Aims

1. To produce a preliminary biological inventory (within the selected faunal/floral groups) of the three highlands (Njesi Plateau, Mt Chitagal, Mt Sanga) of the Serra Jecci during a short field survey.

2. To document the distribution, population taxonomy and behaviour of the critically endangered Long-billed Tailorbird (*Artisornis moreaui*).

3. To collate data for future analysis to gain insight in the biogeographical linkages of the mountains of Niassa within the Eastern Africa sky islands/Eastern Afromontane biodiversity hotspot.

Figure 3. Expedition team from left to right: Tristan Egremont-Lee, Sam Jones, Tim van Berkel, Emidio Sunbane, Merlijn Jocque, James Egremont-Lee, Justin Clause, Pim Niesten, Basidio Buanar, Tomach Amide, Tuaibo Amasse, Basidiomar, Gabriel Jamie, Lore Geeraert, Hassan Patel, Mac Stone (Picture: Mac Stone).

Access and logistics

Prior to our visit we selected target study areas on the highland peaks of Mt Chitagal, Mt Sanga and the Njesi Plateau (visited in this order). Our site selections were based on extent of evergreen and riparian forest patches visible via Google earth satellite imagery- the target habitat type of interest. Prior to our visit, a reconnaissance was undertaken by John Mkumbira from the Rift Valley Corporation to gain permissions of local communities, organise ceremonial offerings (undertaken at the foot of each mountain before accessing sites) and organise teams of local staff. The selected study sites were then validated in-country against local topographical maps and by recommendations of our guides and porters, particularly on account of availability of fresh water. Access to both Mt Chitagal and Mt Sanga began by approaching as closely as was possible by car via the road (ER133), running due north from Unango to Macalonge to the east (see Fig 2). Access to the Njesi Plateau began from the south via a smaller road accessed from the national road running north-west from Lichinga (EN249). After driving as close as we were able, we then proceeded on foot, the specific routes of which were determined on the ground with local knowledge. The expedition (excepting internal flights) began from the provincial capital of Lichinga (see Fig 2). Field time at each site was limited to a maximum of 6 days owing of the logistical demands of each 'mini-expedition' to each site.

At each study site, a temperature/humidity logger (HOBO Onset U23/001 temp/RH) was deployed to provide descriptive information on local variation on microclimate during our survey time. Loggers were deployed in forest patches away camp and direct sunlight at ~4ft above the ground and logged both temperature and humidity at 30minute intervals.

Mt Chitagal (6-12 November)

Access began on a track suitable for a 4x4 vehicle leading to a grassland/dambo area into good quality Miombo woodland towards the base of Mt Chitagal. From this drop off point (roughly at -12.601887, 35.321548), a path led to the north-west (presumably used by local hunters) to a river running through the Miombo woodland where we camped on the night of 6th November (-12.592033, 35.306667). From here we made our ascent of Mt Chitagal (taking c.6hours). Pristine Miombo woodland was present up to an altitude of ~1350m where it was replaced by more open grassland and riparian forest patches. Our base camp was situated in a large patch of riparian/evergreen forest slightly below and to the south-east of the main summit of Mt Chitagal. This camp, in a valley by a small stream (-12.597117, 35.262750) was at an altitude of 1428masl and allowed access to a variety of different habitats on the summit.

As a whole, the extent of evergreen forest on Mt Chitagal appears to be naturally patchy, with the largest block on the summit of the mountain (-12.596000, 35.253217). This block of forest in particular was characterised by a high canopy (30m+) and apparently old growth trees. Below the summit are numerous run-offs that form tongues/strips of evergreen and riparian forest where in some at least, running water is present (similar to that our camp was situated in). Surrounding each of these forest strips were large areas of high grassland/scrub that, during our visit, had been recently burnt,

interspersed with rocky outcrops. Generally there was little evidence of current human disturbance excepting for one or two large snares and two small hunting camps encountered during the hike through the Miombo woodland to our adopted base camp. At one of these camps was the casque of a hunted Buffalo. Large mammal trails and scat were numerous throughout the Miombo and grassland, particularly Buffalo. We did find numerous remains of old pots on the summit of Mt Chitagal, however, apparently remnants from the civil war.

Figure 4 and subsequent figures display typical habitats encountered on Mt Chitagal.

Temperature (in C): Mean±sd: 21.5 ±4. Range: 28.5-15.7
Relative humidity (%): Mean±sd: 58.9±16.7. Range: 90.6-27.3

Figure 4. Google earth satellite imagery of the summit of Mt Chitagal showing the habitat matrix present with dark green forest patches, riparian strips, grassland and rocky massifs. Lighter green patches on the left and right of the image are lower elevation miombo woodland.

Figure 5. Part of the expedition team approaching Mt Chitagal, showing the grasslands surrounding riparian forest strips (Picture: Mac Stone)

Figure 6. Interior of old growth, high-canopy evergreen forest on the summit of Mt Chitagal (the large block evident in Fig 4) (Picture: Mac Stone).

Figure 7. Interior of riparian forest surrounding camp (Picture: Mac Stone).

Mt Sanga (13-19 November)

Access began from the village at the foot of Mt Sanga (-12.347350, 35.379117). From this point we followed a path to the south-west through agricultural land and then disturbed Miombo woodland to the foot of the mountain. On the slopes of Mt Sanga, the Miombo woodland was undisturbed up to its upper elevational limits (~ 1450masl) where it was replaced by rocky plateau, interspersed with evergreen forest. Overall, access to the summit of Mt Sanga took 4-5hrs. A base camp was set-up in the edge of a patch of evergreen forest at the summit at 1702masl (-12.383633, 35.335150). There was no reliable water supply at the summit, necessitating shuttling water in each day.

Forest on top of Sanga was also patchy and limited to a series of distinct blocks at the highest elevations. The edges of these forest blocks were thick and tangled with smaller amounts of high canopy forest present compared to Mt Chitagal (the canopy was also lower than that on the summit of Mt Chitagal). The main summit of the mountain is a rocky plateau with a sheer rock escarpment on the western edge. Mt Sanga is isolated from the other mountains in the 'chain' by some 20km from Mt Chitagal and perhaps as a result was notably windier and often cooler. Recent burning (whether natural or man-made) was evident through both the miombo and rocky plateau, although its extent appeared slightly less than that on Mt Chitagal. We found no obvious/direct evidence of disturbance by human activities on the summit Mt Sanga, perhaps a symptom of the apparent presence of local spirits that some of the local people were wary of.

Temperature (in C): Mean±sd: 19.43±2.4. Range: 23.6-15.3
Relative humidity (%): Mean±sd: 65.9±14.5. Range: 91.6-43.7

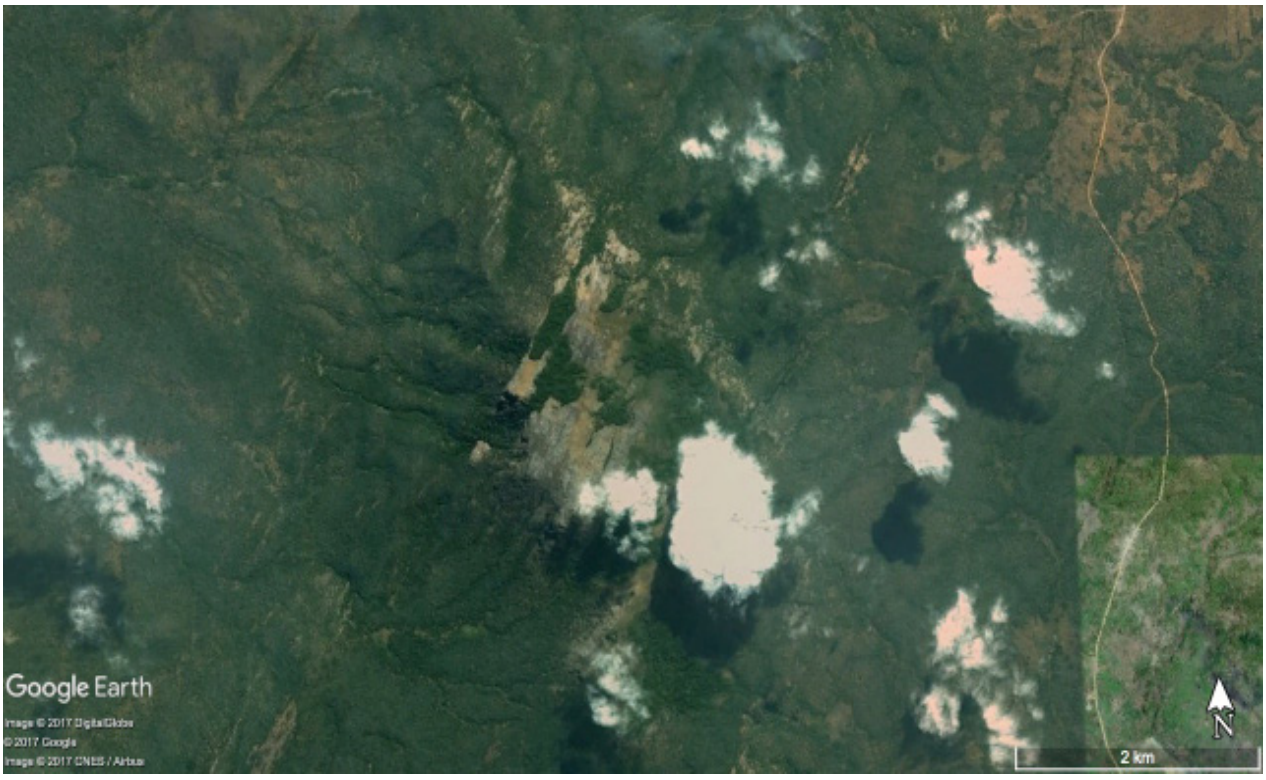

Figure 8. Google earth satellite imagery of Mt Sanga, showing rocky escarpment and extent of forest cover (the dark green patches of evergreen forest compared to surrounding Miombo woodland at lower elevations). A large patch of forest also exists beneath the cloud to the south-easterly edge of the mountain.

Figure 9. Summit habitat on Mt Sanga of rocky plateau and grassland with patches of evergreen forest (Picture: Mac Stone).

Figure 10. Forest interior on the summit of Mt Sanga (Picture: Mac Stone).

Figure 11. Aerial view of Mt Sanga showing rock escarpment on the western edge of the mountain and evergreen forest patches (Picture: Mac Stone).

Njesi Plateau (21-25 November)

Access began by 4x4, taking a dirt farm track running north from the ER249 to the base of the plateau (-12.866716, 35.184997). Initially we ascended the eastern 'tongue' of the plateau through a mix of high grassland and disturbed shrub, where upon reaching the summit of the plateau, high grassland and small forest patches predominated. From here we continued northwards, setting up camp in the edge of a forest patch (-12.832617, 35.186933) at 1728masl where water was available from a small stream in an adjacent gully.

Habitat on the Njesi Plateau was notably different to the other two mountains. While forest patches were plentiful, there was little continuous closed canopy forest with generally only a few large trees dominating and large amounts of thick tangles, typical of edge or possibly historically disturbed habitats. Between these forest patches, high grassland was most common where recent burning had also occurred (similar to that on Mt Chitagal), although some patches of different grassland were also present. Despite limited numbers (at least obviously) of local communities in close proximity to Njesi, there was an extensive presence of local hunters/poachers with large numbers of snares of many sizes (for larger mammals to birds such as francolins) found. The only rainfall of the expedition fell during transit to our base camp on Njesi on the 21st.

Temperature (in C): Mean±sd: 18.3±3.9. Range: 31.4-12.9
Relative humidity (%): Mean±sd: 74.4±15.4. Range: 91.9-32.9

Figure 12. Google earth satellite imagery of the Njesi Plateau, showing dark green forest patches amid grassland. Our surveys were undertaken on the eastern (right-hand) 'lobe' of the plateau.

Figure 13. Aerial image above base camp on the Njesi Plateau, showing grassland adjacent to forest patches and the scrubby nature of forest on the plateau (Picture: Mac Stone).

Figure 14. Grassland patch on the Njesi plateau, differing from the taller coarser typical grassland encountered on Njesi (and also Mt Chitagal) (Picture: Mac Stone).

Biodiversity surveys

1. Avifauna

Sam Jones & Gabriel Jamie

Mozambique north of the Zambezi river remains very poorly known ornithologically. The Zambezi river is the northerly limit of the southern African recording region and, as a result, is not included in important works on the southern African (e.g. Sinclair et al. 2011, Hockey et al. 2005), or eastern African avifaunas (Stevenson & Fanshawe 2002). Indeed, the only field guide covering the region is that of Sinclair & Ryan (2010), which encompasses the whole of Africa south of the Sahara. The only bird checklist published on the general region is Parker (2005), who produced one for the Niassa game reserve. However, at the time of publishing this did not encompass any explored Afromontane habitats. Despite this paucity of knowledge, the Njesi Plateau and Mt Chitagal have seen some, albeit very limited, ornithological survey effort. We are aware of no prior ornithological survey efforts on Mt Sanga.

Jali Makawa collected specimens of 29 species during his visit to the Njesi Plateau (Benson 1946), including the discovery and subsequent description of a new subspecies of the rare Long-billed Tailorbird *Artisornis moreaui* (alt: Long-billed Forest Warbler). This taxon was previously known only from one other locality in north-eastern Tanzania (Benson 1945). The area was not visited again by ornithologists until after the end of the civil war in 2001, when the presence of the tailorbird was confirmed with a sighting of a pair by P.G.Ryan in a forest patch to the south-west of Mt Chitagal (Ryan & Spottiswoode 2003). In publishing this finding, Ryan & Spottiswoode (2003) also produced a checklist of birds from the Njesi Plateau including both their and Jali Makawa's findings. This gave a preliminary bird list of 94 species. All but 13 of the species Jali Makawa collected were also observed by Ryan & Spottiswoode (2003). Due to the presence of several range-restricted and/or threatened species, the plateau and surrounding area was designated as an Important Bird Area by BirdLife international in 2001 (BirdLife International 2016). However, at the time of writing, some information presented for the IBA by Parker (2001) is incorrect and states that both Spot-throat *Modulatrix stictigula* and Cholo Alethe *Alethe choloensis* are present, despite both not having been recorded from the region.

Prior to our expedition, the Long-billed Tailorbird was known from only two localities - the Njesi Plateau/Mt Chitagal, where the subspecies *sousae* was described by Benson (1945), and the East Usambara mountains in Tanzania, some 950km away, where the nominate subspecies occurs. The species is not known to occur in between these areas despite much of the area having been surveyed ornithologically (Baker & Baker 2001). Until recently it was listed as Critically Endangered (thought to number fewer than 250 individuals), owing to its very small range, low densities and apparent continued declines. However, virtually nothing is known of the Mozambican population's size or range (BirdLife international 2015). Ryan & Spottiswoode (2003) speculated that the Njesi area may harbour a substantial population, which might result in the species' threat status being downgraded. Only a single study has ever been published focussing on any aspect of the Long-billed Tailorbird's general ecology (McEntee 2005). It has recently been proposed that the Mozambican and Tanzanian populations are distinct species (N. Collar pers comms.) and will soon be treated as such by the Handbook of the Birds of the World taxonomy (which the IUCN RedList follows). Throughout the course of writing this report the IUCN Red List status of the Long-billed Tailorbird has changed, where the Tanzanian and

Mozambican populations are treated as indepdendent taxa and given independent Red List assessments. For consistency with previously published work, we retain the specific epithet *moreaui* throughout, instead of *sousae*. However, because the two populations are given different Red List assesments, we use that given to *Artisornis sousae* (Endangered), not that for the Tanzanian population *Artisornis moreaui* (Critically Endangered).

The ecology of the two populations of Long-billed Tailorbird is thought to differ from each other, with birds in the Usambaras apparently occupying the forest understorey, whilst the Njesi birds forage in the canopy. It has been hypothesised that competitive interactions between Long-billed Tailorbirds and similar species mediate this difference in foraging behaviour (Stuart 1981). In Mozambique, where Long-billed Tailorbirds co-occur with African Tailorbirds (*Artisornis metopias*, a closely-related understorey insectivorous species) the Long-billed Tailorbird forages in the canopy. By contrast, in Tanzania, where African Tailorbird does not occur, the Long-billed Tailorbird forages in the understorey. It should be noted, however, that this assertion of birds exclusively foraging in the understorey was largely based on anecdotal evidence. In collecting foraging data to address this, McEntee (2005) found that, whilst Long-billed Tailorbirds of the Usambaras forage at an average height of 3.9m, they can also go up as high as 24m. Previous authors have also challenged the role of competitive interspecific interactions shaping these ecological differences (Cordeiro et al. 2001).

Preparatory work

In preparation for the expedition we reviewed all available ornithological literature from the mountains we were visiting (no prior literature existed for Mt Sanga) and of other mountains in northern/central Mozambique (Mount Namuli, Mabu, Chiperone, Inago, Mecula, Gorongosa) and Malawi (Mt Mulanje), that have been subjected to survey effort. From this we produced a table showing presence/absence for bird species on each mountain that will be published at a later date. We visited the bird collections at the Natural History Museum in Tring, Hertfordshire, to measure Long-billed and African Tailorbird specimens and familiarise ourselves with some other species groups likely to be encountered on the mountains. Finally, we compiled an extensive sound recordings archive from pre-existing recording sets, further augmented with recordings of particular species from the online avian sound repository xeno-canto (www.xeno-canto.org).

Survey methodology

Our methodology for surveying birds on the mountains had three components:

1) Dawn chorus recordings

We followed a methodology proposed by Herzog et al (2016), using directional shotgun microphones. A given survey site was visited at or soon after first light where a 15 minute, uninterrupted, dawn chorus recording was made. During the first 8 minutes of the recording, the recordist initially pointed the microphone in the direction of greatest vocal activity and then rotated 90 degrees clockwise every minute until two rotations were completed. For the remaining 7 minutes recordings were made opportunistically/irrespective of direction to document the vocalisations of species not recorded in the previous 8 minutes or to get better recordings of species already recorded. Dawn recording sites were selected arbitrarily owing to occasionally challenging access, but each site was a minimum of 130m

from one another (typically 200m+ following recommendations in Herzog et al 2016).

2) Mist-netting

We erected mist nets in and at the edge of evergreen forest patches on all three mountains. Net lengths used were 6m, 9m and 12m. Nets were opened arbitrarily, but generally from around 0700 and remained open until around midday to coincide with times of peak activity. In addition to untargeted survey mist-netting we also conducted targeted netting for Long-billed and African Tailorbirds. This involved setting nets in tailorbird territories and using playback of their vocalisations to draw them in. Captured birds from both methods were fitted with a small coloured ring to allow unique identification, checked for moult (body and flight-feather), breeding condition, and measured for the following biometrics– maximum tarsus, maximum (straightened/flattened) wing chord, tail length, bill tip to anterior nares, bill tip to skull, bill width at anterior nares, bill depth at anterior nares and mass. Blood and feather samples were also taken for the majority of captured birds. A standardised set of photographs (head and eye, spread wing, spread tail and the bird in the photographic grip) was also taken for all captured birds. Untargeted mist-netting was undertaken on 7 days for a total of 88hrs of net time. This effort comprised of 34hrs over 3 days at Mt Chitagal, 32hrs over 3 days at Mt Sanga and 22hrs on 1 day at Njesi.

3) Opportunistic surveying

We also recorded all bird species seen or heard whilst birdwatching on the mountains through non-standardised surveying. Particular effort was made to look for birds in all the main habitat types on the mountain both in the forest and the adjacent grassland. The only habitat type not covered extensively was miombo woodland which only occurred on the lower slopes of the mountains and was largely inaccessible to us, excepting on transfer days to other mountains. To assess breeding behaviour at the time of our visit, we also noted nests and nest-building by different species and report these together with our data on breeding condition of birds caught in mist nets.

4) Camera trapping

As part of the survey work for mammals, camera traps were deployed on all three mountains. The cameras were positioned to best document mammals in the area, but any birds recorded on the cameras were also included in the survey totals.

Target work on the Long-billed Tailorbird

Specific effort was made to gain information on the Long-billed Tailorbird to facilitate analysis on the conservation status of Mozambican population and to establish its genetic distinctiveness from those in Tanzania. To do this we mapped territory localities, minimum territory sizes, collected blood and feather samples through targeted netting, recorded basic habitat characters of territories and conducted experimental playback trials to understand their territorial interactions.

Daily log

At the end of each day we compiled our sightings into the form of a 'daily log'. This comprised a list of all species detected throughout the day with rough estimates of numbers of individuals detected.

This allowed us to calculate a 'bird-days' total for each species - the number of survey days on which a given taxon was recorded. This acts as a rough measure of the species' relative abundance. To reduce the obvious bias in lack of survey effort in some habitat types, we also classified whether species were recorded in highland habitats so that the 'bird-days' total can be taken in context. We classified highland habitats broadly as evergreen forest, riparian forest, high elevation grasslands and rocky massifs.

Species inventory and annotated checklist

An avian species inventory is presented in Table 1.1 for the region as a whole, broken down into each study site. This includes information from other work undertaken in the area, as notified in the 'Survey' column, where '1' denotes species recorded by Jali Makawa (Benson 1946) '2' represents species recorded by Ryan & Spottiswoode (2003) and '3' species recorded on this survey.

A total of 158 species were recorded on our surveys. These include 90 species not previously recorded in the area (those with only a '3' in the "Survey" column) and 9 species first recorded by Jali Makawa but not recorded by Ryan & Spottiswoode 2003 (those with a '1,3' in the "Survey" column). The total avifauna of the area recorded on all three surveys is 179 species. The exact location of Jali Makawa's visit is unclear, but is likely to have been on the northerly end of the Njesi Plateau (see Ryan & Spottiswoode 2003). Therefore all records recorded during his survey are added to the 'Njesi plateau' column. Records published by Ryan & Spottiswoode (2003) are included in the 'Mt Chitagal' column. Below the summary table, we also provide an annotated checklist of species of conservation concern, notable records and then shorter individual accounts for each species. Birds noted with asterisks were those recorded in highland habitats (totalling 111 species).

Owing to the limited data available on breeding phenology and morphometrics of much of the avifauna of the region, we follow these inventories with breeding records and morphometric data collected during the expedition.

Table 1.1 Species recorded in this and other surveys in the Njesi region on each mountain. Survey '1' indicates Benson (1946), '2' indicates Ryan & Spottiswoode (2003) and '3' our survey. The three mountains are abbreviated as Ch (Chitagal), Sa (Sanga) and NP (Njesi Plateau). Taxonomic order follows that in Sinclair & Ryan (2010). The column "Bird-days/20" denotes the number of days out of the total 20 days that we recorded a given species during our expedition. Asterisks by species names denote those recorded in highland habitats on our, and other, surveys.

Table 1.1 Bird species list with occurence at Chitagal (Ch), Sanga (Sa) and Njesi Plateau (NP), and Bird days (Bds/20). Survey '1' indicates Benson (1946), '2' indicates Ryan & Spottiswoode (2003) and '3' our survey.

N°	Vernacular	Scientific	Survey	Ch	Sa	NP	Bds/20
1	Yellow-billed Kite	*Milvus aegyptius**	3	x			1
2	Bateleur	*Terathopius ecaudatus**	2,3	x			1
3	Gymnogene	*Polyboroides typus**	3		x	x	3
4	Dark Chanting Goshawk	*Melierax metabates*	3	x			1
5	African Goshawk	*Accipiter tachiro**	2,3	x		x	4
6	European Honey-Buzzard	*Pernis apivorus*	3		x		1
7	Steppe Buzzard	*Buteo buteo*	3	x	x	x	8
8	Augur Buzzard	*Buteo augur**	3		x		3
9	Aquila sp.	*Aquila sp.**	3	x	x		2
10	Booted Eagle	*Hieraaetus pennatus**	3	x	x		2
11	Crowned Eagle	*Stephanoaetus coronatus**	3	x	x		6
12	Dickinson's Kestrel	*Falco dickinsoni*	3		x		1
13	Sooty Falcon	*Falco concolor**	3		x		1
14	Lanner Falcon	*Falco biarmicus**	3		x		7
15	Peregrine	*Falco peregrinus**	3	x			1
16	Coqui Francolin	*Peliperdix coqui*	3	x			1
17	Hildebrandt's Spurfowl	*Pternistis hildebrandti**	3	x	x	x	14
18	Buff-spotted Flufftail	*Sarothrura elegans**	3			x	3
19	Lemon Dove	*Aplopelia larvata**	3	x	x	x	8
20	African Olive-pigeon	*Columba arquatrix**	1,3		x	x	8
21	Red-eyed Dove	*Streptopelia semitorquata**	3	x		x	9
22	Cape Turtle Dove	*Streptopelia capensis*	3	x	x	x	4
23	Blue-spotted Wood-Dove	*Turtur afer*	3		x		1
24	Tambourine Dove	*Turtur tympanistra**	3	x	x	x	14
25	Livingstone's Turaco	*Tauraco livingstonii**	1,2,3	x	x	x	20
26	Diderick Cuckoo	*Chrysococcyx caprius*	3		x		1

Table 1.1 cont. Bird species list with occurence at Chitagal (Ch), Sanga (Sa) and Njesi Plateau (NP), and Bird days (Bds/20). Survey '1' indicates Benson (1946), '2' indicates Ryan & Spottiswoode (2003) and '3' our survey.

N°	Vernacular	Scientific	Survey	Ch	Sa	NP	Bds/20
27	Klaas's Cuckoo	*Chyrosococcyx klaas*	3	x	x	x	5
28	African Emerald Cuckoo	*Chrysococcyx cupreus**	3	x	x	x	6
29	Levaillant's Cuckoo	*Clamator levaillanti*	3		x		1
30	Red-chested Cuckoo	*Cuculus solitarius**	3	x		x	12
31	Common Cuckoo	*Cuculus canorus**	3		x		1
32	Burchell's Coucal	*Centropus burchellii**	3	x	x	x	11
33	African Wood Owl	*Strix woodfordii**	2,3	x		x	9
34	Spotted Eagle Owl	*Bubo africanus*	3		x		1
35	African Scops Owl	*Otus senegalensis*	3	x			1
36	Freckled Rock Nightjar	*Caprimulgus tristigma**	2,3	x	x	x	12
37	Fiery-necked Nightjar	*Caprimulgus pectoralis**	3	x			3
38	Square-tailed Nightjar	*Caprimulgus fossii*	3	x			2
39	Usambara Nightjar	*Caprimulgus guttifer**	3	x			3
40	Pennant-winged Nightjar	*Macrodipteryx vexillarius*	3	x			1
41	Eurasian Swift	*Apus apus*	3			x	1
42	White-rumped Swift	*Apus caffer*	3		x		1
43	African Hoopoe	*Upupa africana**	3	x	x	x	6
44	Green Wood-Hoopoe	*Phoeniculus purpureus*	3	x			1
45	African Pygmy-kingfisher	*Ispidina picta*	3			x	1
46	Striped Kingfisher	*Halcyon chelicuti*	2	x			0
47	European Roller	*Caracias garrulus*	3		x		1
48	Little Bee-eater	*Merops pusillus**	2,3	x		x	2
49	European Bee-eater	*Merops apiaster**	3	x	x		7
50	Swallow-tailed Bee-eater	*Merops hirundineus*	2	x			0
51	Crowned Hornbill	*Tockus alboterminatus**	2,3	x	x	x	3
52	Trumpeter Hornbill	*Bycanistes bucinator**	3	x	x		9
53	Silvery-cheeked Hornbill	*Bycanistes brevis**	3		x		1
54	Yellow-fronted Tinkerbird	*Pogoniulus chrysoconus**	2,3	x	x	x	12
55	Greater Honeyguide	*Indicator indicator*	3	x			1
56	Scaly-throated Honeyguide	*Indicator variegatus**	3			x	2
57	Red-throated Wryneck	*Jynx ruficollis*	3		x		1
58	Golden-tailed Woodpecker	*Campethera abingoni**	3			x	1
59	Green-backed Woodpecker	*Campethera cailliautii*	2	x			0
60	Cardinal Woodpecker	*Dendropicos fuscescens**	2,3	x		x	5
61	Stierling's Woodpecker	*Dendropicos stierlingi*	1,2	x		x	0
62	African Broadbill	*Smithornis capensis**	3	x			7
63	Rufous-naped Lark	*Mirafra africana*	1,3		x	x	1

Table 1.1 cont. Bird species list with occurence at Chitagal (Ch), Sanga (Sa) and Njesi Plateau (NP), and Bird days (Bds/20). Survey '1' indicates Benson (1946), '2' indicates Ryan & Spottiswoode (2003) and '3' our survey.

N°	Vernacular	Scientific	Survey	Ch	Sa	NP	Bds/20
64	Flappet Lark	*Mirafra rufocinnamomea*	3		x		2
65	House Martin	*Delichon urbicum**	3	x	x	x	5
66	Rock Martin	*Ptyonoprogne fuligula**	3	x	x		4
67	Eastern Saw-wing	*Psalidoprocne orientalis**	2,3	x	x	x	15
68	Barn Swallow	*Hirundo rustica**	3	x	x	x	6
69	Lesser Striped Swallow	*Cecropis abyssinica**	3	x	x	x	4
70	African Pied Wagtail	*Motacilla aguimp*	3		x		3
71	Striped pipit	*Anthus lineiventris**	2,3	x	x		5
72	Tree Pipit	*Anthus trivialis**	3			x	2
73	Pipit sp.	*Anthus sp.**	3			x	1
74	Black Cuckooshrike	*Campephaga flava*	2,3	x			1
75	White-breasted Cuckooshrike	*Coracina pectoralis*	2,3		x		1
76	Square-tailed Drongo	*Dicrurus ludwigii**	2,3	x	x		6
77	Fork-tailed Drongo	*Dicrurus adsimilis*	2	x			0
78	Eurasian Golden Oriole	*Oriolus oriolus**	3	x			1
79	Black-headed Oriole	*Oriolus larvatus*	3	x	x		5
80	Pied Crow	*Corvus albus*	3		x		3
81	Cinnamon-breasted Tit	*Parus pallidiventris*	2	x			0
82	Southern Black Tit	*Parus niger*	3		x		1
83	Spotted Creeper	*Salpornis spilonotus**	1,2,3	x	x	x	2
84	Arrow-marked Babbler	*Turdoides jardineii**	2,3	x	x		3
85	African Hill-babbler	*Pseudoalcippe abyssinica**	1,3			x	3
86	Dapplethroat	*Modulatrix orostruthus**	3	x			3
87	Dark-capped Bulbul	*Pycnonotus tricolor**	2,3	x	x	x	20
88	Yellow-streaked Greenbul	*Phyllastrephus flavostriatus**	3		x		7
89	Placid Greenbul	*Phyllastrephus placidus**	1,3	x	x	x	8
90	Terrestrial Brownbul	*Phyllastrephus terrestris*	2	x			0
91	Little Greenbul	*Eurillas virens**	2,3	x	x	x	19
92	Olive-headed Greenbul	*Arizelolocichla olivaceiceps**	1,3	x	x	x	9
93	Orange Ground-thrush	*Zoothera gurneyi**	2,3	x	x	x	5
94	Kurrichane thrush	*Turdus libonyanus*	2,3	x			1
95	Miombo Rock-thrush	*Monticola angolensis*	1			x	0
96	White-browed Robin-chat	*Cossypha heuglini**	2,3	x	x	x	17
97	Red-capped Robin-chat	*Cossypha natalensis**	2,3	x	x		8
98	Cape Robin-chat	*Cossypha caffra**	1,2,3	x	x	x	13
99	White-starred Robin	*Pogonocichla stellata**	1,2,3	x	x	x	14
100	White-browed Scrub-robin	*Erythropygia leucophrys**	3		x		1

Table 1.1 cont. Bird species list with occurence at Chitagal (Ch), Sanga (Sa) and Njesi Plateau (NP), and Bird days (Bds/20). Survey '1' indicates Benson (1946), '2' indicates Ryan & Spottiswoode (2003) and '3' our survey.

N°	Vernacular	Scientific	Survey	Ch	Sa	NP	Bds/20
101	Common Stonechat	*Saxicola torquatus**	1,2,3	x		x	8
102	Familiar Chat	*Cercomela familiaris**	2,3		x	x	2
103	Arnott's Chat	*Pentholaea arnotti*	1,2	x		x	1
104	Mocking Cliff-chat	*Thamnolaea cinnamomeiventris**	1,3	x		x	1
105	Evergreen Forest Warbler	*Bradypterus lopezi**	1,2,3	x	x	x	19
106	Little Rush Warbler	*Bradypterus baboecala*	3		x		1
107	Marsh Warbler	*Acrocephalus palustris*	3		x		1
108	Hipploais sp.	*Hippolais sp.**	3		x		1
109	Dark-capped Yellow Warbler	*Iduna natalensis**	1,3			x	5
110	Willow Warbler	*Phylloscopus trochillus**	3	x	x	x	9
111	Blackcap	*Sylvia atricapilla**	3			x	3
112	Garden Warbler	*Sylvia borin**	3		x	x	11
113	Red-faced Cisticola	*Cisticola erythrops**	2,3		x	x	5
114	Singing Cisticola	*Cisticola cantans*	2				0
115	Lazy Cisticola	*Cisticola aberrans**	1,2,3	x	x	x	6
116	Yellow-breasted Apalis	*Apalis flavida**	2,3	x			2
117	Black-headed Apalis	*Apalis melanocephala**	1,2,3	x	x	x	16
118	Tawny-flanked Prinia	*Prinia subflava**	2,3	x	x	x	10
119	Red-winged Warbler	*Heliolais erythropterus**	3	x	x		8
120	Red-faced Crombec	*Sylvietta whytii*	2	x			0
121	Yellow-bellied Eremomela	*Eremomela icteropygialis*	2,3	x			2
122	Green-capped Eremomela	*Eremomela scotops*	1,2	x		x	0
123	Green-backed Camaroptera	*Camaroptera brachyura**	2,3	x	x	x	9
124	Stierling's Wren-warbler	*Calamonastes stierlingi*	2,3	x	x		6
125	African Tailorbird	*Artisornis metopias**	1,2,3	x		x	11
126	Long-billed Tailorbird	*Artisornis moreaui**	1,2,3	x	x	x	17
127	Yellow-bellied Hyliota	*Hyliota flavigaster*	2,3	x			2
128	Southern Hyliota	*Hyliota australis*	1	x			0
129	Ashy Flycatcher	*Muscicapa caerulescens**	3		x		1
130	Dusky Flycatcher	*Muscicapa adusta*	2	x			0
131	Spotted Flycatcher	*Muscicapa striata*	3		x		1
132	African Paradise-flycatcher	*Terpsiphone viridus**	3	x	x	x	8
133	White-tailed Crested Flycatcher	*Elminia albonotata**	1,2,3	x	x	x	14
134	Dark Batis	*Batis crypta**	3	x			1
135	Pale Batis	*Batis soror**	2,3	x	x		3
136	Black-throated Wattle-eye	*Platysteira peltata**	2,3	x	x		4

Table 1.1 cont. Bird species list with occurence at Chitagal (Ch), Sanga (Sa) and Njesi Plateau (NP), and Bird days (Bds/20). Survey '1' indicates Benson (1946), '2' indicates Ryan & Spottiswoode (2003) and '3' our survey.

N°	Vernacular	Scientific	Survey	Ch	Sa	NP	Bds/20
137	Black-backed Puffback	*Dryoscopus cubla**	2,3	x	x	x	19
138	Brubru	*Nilaus afer*	3	x		x	3
139	Tropical Boubou	*Laniarius major**	2,3	x	x	x	20
140	Orange-breasted Bush Shrike	*Chlorophonus sulfureopectus**	2,3	x	x	x	10
141	Brown-crowned Tchagra	*Tchagra australis**	3	x		x	2
142	Black-crowned Tchagra	*Tchagra senegala**	2,3	x	x		8
143	White-crested Helmetshrike	*Prionops plumatus*	2	x			0
144	Retz's Helmetshrike	*Prionops rentzi*	2,3	x	x		1
145	Violet-backed Starling	*Cinnyricinclus leucogaster**	3	x	x	x	12
146	Red-winged Starling	*Onychognathus morio**	3	x	x		6
147	Scarlet-chested Sunbird	*Chalcomitra senegalensis*	3	x			3
148	Amethyst Sunbird	*Chalcomitra amethystina*	2	x			0
149	Olive Sunbird	*Cyanomitra olivacea**	2,3	x	x	x	15
150	Collared Sunbird	*Hedydipna collaris**	2,3	x	x	x	11
151	Miombo/Forest Double-collared Sunbird	*Cinnyris manoensis/fuelleborni**	2,3	x	x	x	6
152	Variable Sunbird	*Cinnyris venustus*	2	x			0
153	Western Violet-backed Sunbird	*Anthreptes longuemarei*	2	x			0
154	African Yellow White-eye	*Zosterops senegalensis**	2,3	x	x	x	11
155	Yellow-throated Petronia	*Gymnoris superciliaris*	2,3	x			1
156	Spectacled weaver	*Ploceus ocularis**	2,3	x	x	x	17
157	Village Weaver	*Ploceus cucullatus*	3		x		1
158	Bertram's weaver	*Ploceus bertrandi**	2,3	x		x	4
159	Dark-backed Weaver	*Ploceus bicolor**	2,3	x	x		11
160	Olive-headed Weaver	*Ploceus olivaceiceps*	1,2	x		x	0
161	Yellow Bishop	*Euplectes capensis*	2,3	x			2
162	Black-winged Bishop	*Euplectes hordeaceus**	3	x	x	x	11
163	Red-collared Widowbird	*Euplectes ardens*	2	x			0
164	Orange-winged Pytilia	*Pytilia afra*	3		x		1
165	Green Twinspot	*Mandingoa nitidula**	3	x			1
166	Red-throated Twinspot	*Hypargos niveoguttatus*	2	x			0
167	Red-faced Crimsonwing	*Cryptospiza reichenovii**	1,3	x		x	3
168	Jameson's Firefinch	*Lagonosticta rhodopareia**	2,3		x	x	6
169	Bronze Mannakin	*Spermestes cucullatus*	3		x		1
170	Yellow-bellied Waxbill	*Coccopygia quartinia**	2,3		x		1
171	Common Waxbill	*Estrilda astrild**	2,3	x		x	8
172	Purple Indigobird	*Vidua purpurascens*	3		x		1

Table 1.1 cont. Bird species list with occurence at Chitagal (Ch), Sanga (Sa) and Njesi Plateau (NP), and Bird days (Bds/20). Survey '1' indicates Benson (1946), '2' indicates Ryan & Spottiswoode (2003) and '3' our survey.

N°	Vernacular	Scientific	Survey	Ch	Sa	NP	Bds/20
173	Pin-tailed Whydah	*Vidua macroura*	3		x		1
174	Reichard's Seedeater	*Crithagra reichardi*	1,2	x		x	0
175	Yellow-fronted Canary	*Crithagra mozambica*	3		x		2
176	Brimstone Canary	*Crithagra sulphurata**	3			x	2
177	Southern Citril	*Crithagra hyposticta**	3	x	x	x	11
178	Vincent's Bunting	*Emberiza vincenti**	3	x	x		5
179	Cabanis's Bunting	*Emberiza cabanisi**	2,3	x	x	x	10
		Total – 179 species		**126**	**108**	**85**	

Notable records

Species of conservation concern

All species recorded on all surveys (179 species) were checked against the latest IUCN RedList assessments at the time of writing. Five species were classified as 'Near-threatened' (Bataleur *Terathopius ecaudatus*, Crowned Eagle *Stephanoaetus coronatus*, Sooty Falcon *Falco concolor*, Stierlings Woodpecker *Dendropicos stierlingi* and Olive-headed Weaver *Ploceus olivaceiceps*) 1 'Vulnerable' (Dapplethroat *Modulatrix orostruthus*) and 1 'Endangered' (Long-billed Tailorbird *Artisornis moreaui*). All other recorded species were classified as 'Least Concern'. Threat statuses of non-'Least Concern' species are noted in the annotated checklist. Two species, that of Stierlng's Woodpecker and Olive-headed Weaver classified as 'Near-threatened' are not present in the annotated checlist because neither were recorded during our field surveys (see Table 1.1)

Long-billed Tailorbird (*Artisornis moreaui*)

IUCN Red List 'Endangered'. We were pleased to find Long-billed Tailorbirds to be common (multiple territories observed daily) in virtually all suitable habitat at all three sites surveyed (Njesi Plateau, Mt Chitagal and Mt Sanga). All observations occurred between 1430-1850masl, the upper limit representing the highest altitudes we reached during the expedition. The observations on Mt Sanga represent a range extension of about 28km for the *sousae* subspecies of Long-billed Tailorbird and this now constitutes its northernmost known population. At all three sites, birds were found in the mid-storey and canopy (never the understorey) particularly in areas of the forest with a gap or clearing (such as that created by a tree fall) and dense vine tangles. Birds occurred both in the patches of riparian forest which run down from the tops of the mountains as well as on the taller evergreen forest patches that sit at the very top of Mt Sanga and Mt Chitagal. The locations of over 30 territories were marked to train a species distribution model as to the available habitat occupancy of the species. Additionally, the territory boundaries (with at least 4 points) of 7 territories were marked by following colour-marked individuals (1 at Chitagal and 3 each at Njesi and Sanga). Mean territory size was 1531m^2(±971) with a range between 366-3500m^2.

The Long-billed Tailorbirds were highly vocal and territorial, responding aggressively to playback of their own species song but not to playback of the songs of African Tailorbird or other sympatric control species such as Little Greenbul, Forest Weaver or Olive Sunbird. Each territory contained a single pair of Long-billed Tailorbirds (excepting one that appeared to be held by a lone male), with both individuals playing an active role in territory defence. Duetting between members of a pair was common and was used frequently in response to a perceived intruder following playback of Long-billed Tailorbird calls. The bird initiating the duet would either give a series of single nasal notes or a rapid repeated chiming two-note call. We extensively documented their vocalisations, which can be found on the online archive, xeno-canto (http://www.xeno-canto.org/species/Artisornis-moreaui).

Generally, we found that the bird initiating the duet (possibly the male as they had consistently larger biometrics than the other bird in the pair when they were caught and colour-ringed) was more aggressive and 'bold' in territory defense (the so-called "initiator"), reacting sooner to the playback, calling more often and approaching the speaker closer than the 'responder' of the duet. Of 12 captured individuals, 11 blood samples were collected (1 from Chitagal and 5 each from Njesi/Sanga). Taken together, our targeted work on the Long-billed Tailorbird will better our understanding of the Mozambican range, population size and therefore its conservation status. Additionally, the blood samples collected will shed light on the evolutionary history of the Mozambican population and its status as a separate species from populations in Tanzania. Work addressing these questions is currently underway.

African Tailorbird (*Artisornis metopias***)**

African Tailorbirds were recorded at the Njesi Plateau and Mt Chitagal but not on Mt Sanga. Their absence from Mt Sanga was surprising given the presence of Long-billed Tailorbirds there and that African Tailorbirds are present on many of the mountains further north in Tanzania. At both Njesi and Chitagal, African Tailorbirds were found exclusively in the understorey particularly at forest edge and clearings in both riparian and evergreen forests. Interestingly, in the absence of African Tailorbirds, Long-billed Tailorbirds were still found to forage in the canopy and not the understorey on Mount Sanga. This is additional evidence that any foraging niche differences between Mozambican and Tanzanian populations of Long-billed Tailorbird are unlikely to be mediated by the presence/absence of African Tailorbirds as has been suggested previously.

As with Long-billed Tailorbirds, African Tailorbirds were found to be highly territorial, with both members of a pair defending the territory using duetting and close approach of the perceived intruder. Aggressive territorial behaviour was recorded only in response to playback of African Tailorbird songs and not to Long-billed Tailorbird vocalisations or those of other sympatric species.

Usambara Nightjar (*Caprimulgus guttifer***)**

Three birds were sound recorded calling over the montane forest/grassland on Mt Chitagal in the evening at around 6pm on 9th November. Single birds were also heard calling pre-dawn over the riparian forest we were camping in at Chitagal in on 10th and 11th November.

Usambara Nightjar is sometimes treated as a subspecies of Rwenzori Nightjar (*C. ruwenzorii guttifer*).

Neither the taxon *guttifer* nor Rwenzori Nightjar more broadly has been recorded in Mozambique before. Usambara Nightjar is also known from north-east Zambia, Malawi and Tanzania.

Dapplethroat [alt: Dappled Mountain Robin] (*Modulatrix orostruthus*)

IUCN Red List 'Vulnerable'. Two birds were caught in mist-nets on 8th November in riparian forest at Mt Chitagal. On 9th November one was caught on a camera trap in forest at the top of Mt Chitagal and then, on 11th November, one was photographed again in the top forest at Mt Chitagal.

This species is a highly localised endemic to the Eastern Arc Mountains. It had previously been recorded on Mt Mabu and Mt Namuli in north-central Mozambique and in the Udzungwa and Usambara mountains of Tanzania to the north. The discovery of this species on Mt Chitagal fills a significant range gap in the distribution of this threatened Afromontane endemic.

Dark Batis (*Batis crypta*)

One female was caught in a mist-net in the forest at the top of Mt Chitagal on 10th November. This species is an endemic to Eastern Arc Mountains previously only recorded from Tanzania and extreme NW Malawi (Fjeldså et al. 2006). This represents a first record for Mozambique and significant range extension.

African Hill-babbler (*Pseudoalcippe abyssinica*)

We found several individuals of this species in the patches of riverine forest on the Njesi Plateau. We photographed two birds and obtained sound recordings of songs and vocalisations of other individuals. Birds were detected on 22nd, 23rd and 24th November.

This species was first recorded on the Njesi Plateau by Jali Makawa in 1945 who collected several specimens. The species was not recorded by Ryan & Spottiswoode during their 2001 visit. The subspecies present is that of *stierlingi* and represents the only known population in Mozambique.

Blackcap (*Sylvia atricapilla*)

2-3 birds (both males and females) were seen on 22nd, 23rd and 24th November moving through scrub and mid-storey vegetation at the forest edge on the Njesi Plateau. Several birds were also heard to sing. This species was outnumbered approximately 10 to 1 by Garden Warbler (*Sylvia borin*) which was very common in the same habitat on Njesi Plateau throughout the period of observation there.

This species generally winters from Tanzania north and was first recorded in Mozambique on 5-6 December 2001 on the Muretha Plateau of Mt Namuli by Melo et al. (2006) and has subsequently been recorded on Mt Gorongosa (Gary Allport pers comm.). Our records thus represent some of the first records for Mozambique, although it is likely that the species is a more regular migrant than currently appreciated in the country, at least in the north.

Vincent's Bunting (*Emberiza vincenti***)**

A single individual was seen on the rocky peak of Mt Chitagal by Merlijn Jocque on 11th November. Several individuals were seen on the rocky top of Mt Sanga by various observers in the team between the 14th and 18th November.

The first record of this species for Mozambique was by Jack Vincent in 1933 who collected specimens from Zobué on the border with Malawi. Subsequently the species was found on Mt Inago (Fishpool & Bayliss 2010) and then on Mt Mecula in the Niassa Game Reserve (Spottisoode et al. 2016). Our records represent the fourth and fifth localities for this species in Mozambique.

Green Twinspot (*Mandingoa nitidula***)**

Two birds were observed and photographed foraging in the mid-storey of the 'upper forest' on Mt Chitagal on the 11th November. This secretive species has only been recorded on Mts Mabu and Mulanje in our literature reviews but occurs relatively widely (although uncommonly) elsewhere to the north and west. We are aware of no other records for northern Mozambique, thus representing a minor range extension into the region.

Olive-headead Greenbul *(Arizelocichla olivaceiceps)*

Recorded relatively commonly (but not abundant) at all three sites, the first since Jali Mkawa's visit in 1945. This is the only known population in Mozambique. Olive-headed Greenbul is highly range restricted and endemic to a extreme southern Tanzania and Malawi.

Yellow-streaked Greenbul (*Phyllastrephus flavostriatus*)

This species was conspicuous and were recorded daily on Mt Sanga and were clearly the dominant Pycnonotid species at this site. Recorded on Mts Mabu, Inago, Mabu, Namuli and Chiperone in Mozambique, but distributed widely throughout the highlands of Tanzania. This locality at Mt Sanga represent a range extension into northern Mozambique of this patchily distributed species.

Southern Citril (*Crithagra hyposticta***)**

Commonly recorded on all peaks, generally in small group (2-5), but up to ~35 birds (in the evening-possibly to roost?) on Mt Sanga on the 21st Nov. This taxon is common and widespread throughout Tanzania and Malawi and recorded in a few localities in Mozambique, namely Mts Inago, Chiperone and Namuli. These represent the first documentation of the species in north-western Mozambique and constitutes a minor range extension.

Bertram's Weaver (*Ploceus bertrandi*)

Recorded on Njesi only. This range-restricted species is endemic to south-eastern Africa its range in northern Mozambique is poorly known. During other work on Mozambiques mountains, it has been recorded on Mts Mabu, Chiperone and Namuli.

Full annotated checklist

Yellow-billed Kite *Milvus aegyptius*

Single bird in flight over Mt Chitagal on 7th November.

Bataleur *Terathopius ecaudatus*

IUCN RedList 'Near-threatened'. A single bird (male) was recorded on Mt Chitagal flying north over the rocky massif on 11th November.

Gymnogene *Polyboroides typus*

Single birds were recorded on three dates at Mt Sanga (1) and the Njesi Plateau (2) on the 15th, 21st and 24th November.

Dark Chanting Goshawk *Melierax metabates*

Single bird observed in a dambo patch in miombo woodland on the 6th November at the foot of Mt Chitagal.

African Goshawk *Accipiter tachiro*

Single birds were recorded on four dates on both Mt Chitagal (3) and the Njesi plateau (1). All sightings involved individual birds, typically calling while flying above the forest canopy.

European Honey-Buzzard *Pernis apivorus*

A single bird (adult) was observed perched in the top of a tree on the 19th November at the base of Mt Sanga in disturbed miombo-farmland edge habitat.

Steppe Buzzard *Buteo buteo*

Frequently recorded (8 dates) at all three sites. Typically singles flying over but 2 s een together on the 13th on Mt Sanga.

Augur Buzzard *Buteo augur*

Single birds were recorded flying over Mt Sanga on the 13th and 19th; and at the base of the Njesi Plateau 25th November.

Aquila sp. *Aquila sp.*

Single bird flying over Mt Chitagal on 9th November. Presumed migrant on passage. Probably Steppe or Tawny Eagle.

Booted Eagle *Hieraaetus pennatus*

Single birds and a pair (all dark morphs) were recorded on the 12th and 13th November at the base of Mt Chitagal and Mt Sanga respectively. Additionally, one bird at the summit of Mt Sanga on 15th November.

Crowned Eagle *Stephanoaetus coronatus*

IUCN Red List 'Near-threatened'. Single birds were recorded relatively frequently (6 dates) at Mt Chitagal and Mt Sanga; often detected flying over the canopy, calling in their distinctive display (sightings likely involeved multiple observations of the same individuals). The species' absence on Njesi was notable and perhaps symptomatic of the lack of mammals this species hunts (monkeys, hyraxes etc.) likely due to the apparent heavy poaching pressure on Njesi

Dickinson's Kestrel *Falco dickinsoni*

A single bird observed hunting over farmland/scrub at the foot of Mt Sanga on 13th November.

Sooty Falcon *Falco concolor*

IUCN Red list 'Near-threatened'. Single record of a 1st-winter bird heading south/south-east over Mt Sanga on the evening of the 14th November. Probably recently arrived migrant.

Lanner Falcon *Falco biarmicus*

A family party of 3 birds (1 adult and 2 juveniles) was observed daily on Mt Sanga. The large escarpment on the western side of the mountain is good nesting habitat and these are probably locally-fledged birds.

Peregrine *Falco peregrinus*

A single record of a bird on the 9th November at Mt Chitagal, flying low over grassland at the base of a rocky outcrop. The main massif on Chitagal (particularly the western side) is certainly suitable for nesting for the species, as are other massifs in the vicinity (e.g. Mts Sanga or Unango). The observed bird appeared larger than the resident race minor and may been a migrant.

Coqui Francolin *Peliperdix coqui*

One bird heard giving "co-qui" call in dusk from miombo woodland at base of Mt Chitagal on 12th November.

Hildebrandt's Spurfowl *Pternistis hildebrandti*

Seen commonly (14 dates) from open grassland, scrub and rocky areas between evergreen forest patches on Mt Chitagal, Sanga and the Njesi Plateau. Particularly vocal before dusk. Only a single bird heard at most on each day at Njesi Plateau compared to up to 5 birds on Mts Chitagal and Sanga. This discrepancy might be due to the more intense hunting pressure on the Njesi Plateau.

Buff-spotted Flufftail *Sarothrura elegans*

3-4 birds calling from within evergreen forest patches on the Njesi Plateau at dusk and through the night on 22nd, 23rd and 24th November.

Lemon Dove *Aplopelia larvata*

Recorded frequently (8 dates) at all three sites, although in small numbers (up to 3 daily). Present in both higland forest patches and riparian forests.

African Olive-pigeon *Columba arquatrix*

Frequently on Mt Sanga and Njesi Plateau (8 dates), but curiously absent from Mt Chitagal. On Sanga up to 2 birds were seen most days in a clearing close to camp. On Njesi, however, the species was common with up to approximately 15 individuals seen daily, often commuting between forest patches.

Red-eyed Dove *Streptopelia semitorquata*

Commonly recorded on both Mt Chitagal and Njesi Plateau. Small flocks seen particularly at Chitagal with up to 15 individuals per day. Less common at Njesi Plateau, although still seen flying between forest patches. Few individuals were heard to sing.

Cape Turtle Dove *Streptopelia capensis*

Birds recorded on 4 dates in miombo and scrub at the bases of all three peaks. However, the species was not detected in habitat at the tops of the mountains.

Blue-spotted Wood-Dove *Turtur afer*

A single bird by a small stream in disturbed scrub at the base of Mt Sanga on 19th November.

Tambourine Dove *Turtur tympanistra*

Commonly recorded (14 dates) at all peaks in small numbers, but not in the higher forest on Mt Sanga (only recorded at this site on the lower slopes). A juvenile captured in a mist-net was in primary moult.

Livingstone's Turaco *Tauraco livingstonii*

Seen and heard commonly (20 dates) in evergreen forest and miombo on all three mountains.

Diderick Cuckoo *Chrysococcyx caprius*

A single bird heard on the 19th November in disturbed scrub at the base of Mt Sanga.

Klaas's Cuckoo *Chyrosococcyx klaas*

Relatively frequent at all sites (single individuals heard on 5 dates), but only in miombo woodlands on lower slopes of mountains.

African Emerald Cuckoo *Chrysococcyx cupreus*

Birds were heard singing at all three sites (6 dates). Our observations probably relate to 3 individuals (1 at each site)

Levaillant's Cuckoo *Clamator levaillanti*

A single bird seen on the 19th November in disturbed scrub at the base of Mt Sanga.

Red-chested Cuckoo *Cuculus solitarius*

Up to 3 individuals recorded daily on Mt Chitagal and Njesi Plateau but absent from Mt Sanga. However, Red-capped Robin-chats on Mt Sanga were heard imitating Red-chested Cuckoos, suggesting that either the cuckoo does sometimes occur on Mt Sanga (or that the robin-chats disperse to other sites where the cuckoo is present).

Common Cuckoo *Cuculus canorus*

A 1st-calendar year bird was in low bushes at edge of rocky outcrop on summit of Mt Sanga on 15th November.

Burchell's Coucal *Centropus burchellii*

Recorded regularly on all three peaks, but in small numbers (a maximum of 3 individuals daily). Birds were only heard and not seen. White-browed Coucal (C. superciliosus) has very similar vocalisations but is not known to occur in the region.

African Wood Owl *Strix woodfordii*

Recorded relatively frequently (9 dates) in evergreen forest patches on Mt Chitagal and the Njesi Plateau. Both male and female song heard regularly post-dusk.

Spotted Eagle Owl *Bubo africanus*

One bird seen on the road after dusk during a drive to the village at the base of Mt Sanga on 12th November.

African Scops-owl *Otus senegalensis*

One bird heard calling from miombo at the base of Mt Chitagal on 12th November

Fiery-necked Nightjar *Caprimulgus pectoralis*

Recorded at Mt Chitagal on 6th, 9th and 12th November. The commonest nightjar at lower altitudes with at least 15 seen/heard on the night of the 12th as we drove after dark from the base of Mt Chitagal. A single bird also recorded at higher elevation (c.1400m) on the scrubby/grass plateau close to our base camp on Mt Chitagal.

Usambara Nightjar *Caprimulgus guttifer*

A new national record for Mozambique. Up to three birds were heard and sound recorded on Mt Chitagal in scrub/grassland surrounding the riverine forests by camp on 9-11th November. See "notable records" for more details on the observations and the taxonomic status of this species.

Square-tailed Nightjar *Caprimulgus fossii*

Heard calling on two occasions, both at the foot of Mt Chitagal, on the 6th (1 individual) and 12th (4+ individuals) November. Not observed at higher elevations.

Freckled Rock Nightjar *Caprimulgus tristigma*

Commonly recorded at all three sites (12 dates). There was extensive areas of suitable rocky habitat on Mt Chitagal and Sanga but the species' presence on Njesi was surprising given that the available habitat was reduced to a few very small isolated rock patches. Particularly common on Mt Sanga (probably owing the large extent of suitable habitat) where 5+ birds were heard from close to camp. Single nests with well developed young were found on Mt Chitagal and Mt Sanga.

Pennant-winged Nightjar *Macrodipteryx vexillarius*

At least four males in full breeding plumage were observed at dusk on 12th November at the base of Mt Chitagal in clearings at the edge of miombo woodland.

Eurasian Swift *Apus apus*

A single bird seen flying at the base of the Njesi Plateau on the 25th November.

White-rumped Swift *Apus caffer*

Two birds seen at the base of Mt Sanga on the 20th November. Another swift species seen closer to Njesi on the same day was probably also this taxon.

African Hoopoe *Upupa africana*

Seen and heard relatively frequently (6 dates) at all three sites. Mainly recorded from the edge of evergreen forest patches

Green Wood-Hoopoe *Phoeniculus purpureus*

2+ birds seen in small group in miombo woodland near base of Mt Chitagal on 12th November

African Pygmy-kingfisher *Ispidina picta*

One bird flew past calling over agricultural-miombo mosaic habitat at base of the Njesi Plateau on 25th November.

European Roller *Caracias garrulus*

One bird iobserved n disturbed scrub/farmland at the base of Mt Sanga on the 13th November.

Little Bee-eater *Merops pusillus*

Single birds seen on Mt Chitagal on 11th November and at the base of the Njesi Plateau on 25th November.

European Bee-eater *Merops apiaster*

Small groups (consisting of up to 10 birds) seen relatively frequently (7 dates) passing over Mt Chitagal and Mt Sanga. Presumably on migration through the area.

Crowned Hornbill *Tockus alboterminatus*

1-2 birds recorded uncommonly (3 dates) at all three sites on the 8th, 17th and 21st November.

Trumpeter Hornbill *Bycanistes bucinator*

Seen and heard relatively frequently (9 dates) on Mt Chitagal and Mt Sanga moving through forest canopy in small groups of up to 4 individuals. Probably not on Njesi due to the lack of taller, closed-canopy forest.

Silvery-cheeked Hornbill *Bycanistes brevis*

At least one bird heard distantly in riparian forest from Mt Sanga on the 16th November.

Yellow-fronted Tinkerbird *Pogoniulus chrysoconus*

Birds commonly heard calling (12 dates) at the base of Mt Chitagal and Mt Sanga and from evergreen forest patches at the top of Mt Sanga and the Njesi Plateau.

Scaly-throated Honeyguide *Indicator variegatus*

One bird seen at the edge of riparian woodland on the Njesi Plateau on 22nd November and again on 23rd November when it was photographed.

Greater Honeyguide *Indicator indicator*

One bird heard and seen in miombo woodland at the base of Mt Chitagal on 12th November.

Red-throated Wryneck *Jynx ruficollis*

One bird seen and photographed at a tree-hole nest containing chicks in miombo woodland on hike down from Mt Sanga on 19th November.

Golden-tailed Woodpecker *Campethera abingoni*

One heard calling from an evergreen forest patch on the Njesi Plateau on 24th November.

Cardinal Woodpecker *Dendropicos fuscescens*

Up to two birds encountered relatively frequently (5 dates) on Mt Chitagal and the Njesi Plateau. Seen

and heard in evergreen forest patches at both sites.

African Broadbill *Smithornis capensis*

Recorded frequently on Mt Chitagal (7 dates). 6 dates relate to 1-2 individuals displaying in evergreen forest around our main campsite near the top of Mt Chitagal. The sighting on 6th November relates to an individual displaying in riparian forest at the base of Mt Chitagal in miombo woodland at our temporary camp at the base of Mt Chitagal.

Rufous-naped Lark *Mirafra africana*

A single bird recorded at the base of Mt Sanga on the 13th November.

Flappet Lark *Mirafra rufocinnamomea*

Single birds observed displaying over scrubland at the foot of Mt Sanga on 19th and 20th November

Rock Martin *Ptyonoprogne fuligula*

Common over rocky massifs at the tops of Mt Chitagal (20+ birds) and Mt Sanga (10+ birds) but not seen on the Njesi Plateau.

House Martin *Delichon urbicum*

Seen on 5 days on Mt Chitagal, Mt Sanga and the Njesi Plateau. This included a total of 80-100 birds in loose flocks over the top of Mt Sanga on 19th November heading eastwards and probably on migration.

Eastern Saw-wing *Psalidoprocne orientalis*

Commonly recorded at all sites on most days of expedition (15 dates) with up to 10 individuals seen per day. Particularly common on Mt Chitagal where groups were observed feeding on the edge of evergreen forest near the summit. Also recorded in a variety of other habitats such as disturbed farmland, evergreen forest and occasionally mixing with other hirundines at the edge of rocky massifs.

Barn Swallow *Hirundo rustica*

Relatively frequent (6 dates) on Mt Chitagal, Mt Sanga and the Njesi Plateau with each observation consisting usually of a few individuals flying over open habitat.

Lesser Striped Swallow *Cecropis abyssinica*

Seen on 4 days on Mt Chitagal, Mt Sanga and the Njesi Plateau - seen more often in groups over woodland at base of each mountain rather than at the top of the mountains.

African Pied Wagtail *Motacilla aguimp*

Up to 3 birds seen around the village at the base of Mt Sanga on 13th, 19th and 20th November

Striped Pipit *Anthus lineiventris*

Several birds (up to 5) seen and heard singing amongst rocks at the top of Mt Sanga. Suitable habitat for this species also occurs at the top of Mt Chitagal where the species may well be presence. We explored the rocky massif at the top of Mt Chitagal on just one afternoon and did not detect the species there.

Tree Pipit *Anthus trivialis*

2-3 birds flying overhead calling on the Njesi Plateau on 22nd, 23rd and 24th November. One photographed perched in tree at edge of evergreen forest patch on Njesi Plateau on 22nd November.

Pipit sp. *Anthus sp.*

Unidentified large pipit species photographed in small tree in scrub/grassland habitat between evergreen forest patches on the Njesi Plateau (20th November). This bird was clearly larger than any other Anthus species seen and accordingly it is mentioned here. Superficially the species looked like Long-billed Pipit Anthus similis, although this would be a significant record of this species (it is not known to occur in the region) and future visits could clarify this.

Black Cuckooshrike *Campephaga flava*

A single bird (female) observed in miombo at the base of Mt Chitagal on the 12th November.

White-breasted Cuckooshrike *Coracina pectoralis*

Single bird observed in miombo at the base of Mt Sanga on the 13th November.

Square-tailed drongo *Dicrurus ludwigii*

Recorded primarily on Mt Chitagal (5 dates), with a pair also observed by Tim van Berkel on Mt Sanga. Particularly common in the forest at the summit of Mt Chitagal (up to 6 individuals recorded daily) but also recorded in riparian forest strips in miombo at the base of the mountain.

Eurasian Golden Oriole *Oriolus oriolus*

A group of 9 birds landed in a tall fruiting tree emerging above riparian forest on Mt Chitagal on 9th November. Briefly landed in tree and then passed on through forest.

Black-headed Oriole *Oriolus larvatus*

Several seen and heard in miombo woodland at bases of Mt Chitagal and Mt Sanga (5 dates).

Pied Crow *Corvus albus*

Common around the village at the base of Mt Sanga (13th, 19th and 20th November).

Southern Black Tit *Parus niger*

Two birds seen together in miombo woodland approximately midway up Mt Sanga on 13th November

Spotted Creeper *Salpornis spilonotus*

Recorded on both Mt Chitagal and Mt Sanga on 11th and 13th November respectively. A single bird was seen in the upper forest at the summit of Mt Chitagal and at least 3 individuals were seen in miombo woodland on the slopes of Mt Sanga.

Arrow-marked Babbler *Turdoides jardineii*

Small groups (up to 8 birds) seen in scrub habitat on Mt Chitagal (9th November) and at the base of Mt Sanga (19th November)

African Hill-babbler *Pseudoalcippe abyssinica*

Up to 3 birds seen and heard in midstorey of evergreen forest patches on the Njesi Plateau on 22nd, 23rd and 24th November. White patch on throat with vertical black streaking suggests these birds are of the subspecies stierlingi. See "notable records" for more details. Birds were both sound recorded and photographed.

Dapplethroat [Dappled Mountain Robin] *Modulatrix orostruthus*

IUCN Red List 'Vulnerable'. Two birds mist-netted in the understorey of riparian forest patch close to campsite on Mt Chitagal on 8th November. Another bird was caught on a trail camera in the evergreen forest patch on the top of Mt Chitagal on 9th November and a bird was seen and photographed in this same forest patch flying up into the midstorey of tree (c.10m high) on 11 November. This represents an important range extension for this species a fills in a gap in its distribution between the Udzungwa mountains in Tanzania to the north and Mt Namuli in Mozambique to the south. See "notable records" for more details.

Dark-capped Bulbul *Pycnonotus tricolor*

Commonly recorded at all three sites (20 date) both in miombo woodland and in edge habitat of evergreen forest patches.

Yellow-streaked Greenbul *Phyllastrephus flavostriatus*

Small groups (of up to around 15 birds) seen frequently (7 dates) primarily in the canopy and midstorey of evergreen forest at the top of Mt Sanga. Flocks moved noisily and quickly through the forest with individuals regularly wing-flicking as they actively gleaned along branches. Individuals would occassionally fly down to eat berries from clumps of Solanum bushes in small clearing near edge of forest. See "notable records" for more details.

Placid Greenbul *Phyllastrephus placidus*

Recorded in small numbers relatively frequently (8 dates) at all three sites in understorey/midstorey of evergreen forest patches.

Little Greenbul *Eurillas virens*

Commonly recorded at all three sites (19 dates). Extremely vocal in understorey of evergreen forest and probably the most frequently detected species in this habitat.

Olive-headed Greenbul *Arizelolocichla olivaceiceps*

Recorded relatively frequently (9 dates) in evergreen forest patches at all three sites. The only known site for this range-restricted species in Mozambique. See 'notable records' for more information.

Orange Ground-thrush *Zoothera gurneyi*

Seen and heard relatively frequently (5 dates) on Mt Chitagal, Mt Sanga and the Njesi Plateau in understorey of evergreen forest patches.

Kurrichane Thrush *Turdus libonyanus*

2 birds (1 seen, 1 heard) in miombo at base of Mt Chitagal on 12th November.

White-browed Robin-Chat *Cossypha heuglini*

Commonly detected (17 dates) in understorey of edge habitat in evergreen forest patches on Mt Chitagal, Mt Sanga and the Njesi Plateau. There were interesting patterns of co-occurrence with the two symptaric robin-chat species on the different mountains. On Mt Chitagal, White-browed Robin-chat was the commonest in areas of evergreen forest with complex understorey e.g. edge habitat and tree-fall gaps, followed by Cape Robin-chat (in open scrub habitat between forest patches) then Red-capped Robin-chat (single individual calling from within more pristine evergreen forest at top of mountain. By contrast, on Mt Sanga, Red-capped Robin-chat was the most common by far in the interior of evergreen forest with White-browed occurring along the edge of this habitat and Cape Robin-chat again being restricted to scrub habitat between forest patches. On the Njesi Plateau, Cape Robin-chat was the most common along the edge of the forest patches, followed by small numbers (1-2) of White-browed Robin-chats in slightly more interior forest. Red-capped Robin-chat was apparently absent from the Njesi Plateau. These differences in relative abundance on each of the three mountains can probably be ascribed to the different habitat structures on each.

Red-capped Robin-chat *Cossypha natalensis*

Common in understorey of evergreen forest on Mt Sanga (where several birds seen/heard daily). Only 1 individual heard calling from evergreen forest patch at top of Mt Chitagal on 10 November. Apparently absent from the Njesi Plateau during our visit.

Cape Robin-chat *Cossypha caffra*

Seen and heard commonly (13 dates) in scrub habitat in between evergreen forest patches on Mt Chitagal and Mt Sanga. Particularly common on the Njesi Plateau where numerous at edge of evergreen forest patches. One nest with young chicks found at base of tree at edge of evergreen forest patch by campsite on Njesi Plateau.

White-starred Robin *Pogonocichla stellata*

Seen commonly (14 dates) in understorey, midstorey and canopy of evergreen forest patches at Mt Chitagal, Mt Sanga and the Njesi Plateau.

White-browed Scrub-Robin *Erythropygia leucophrys*

At least one bird present near village at base of Mt Sanga on 19th November.

Common Stonechat *Saxicola torquatus*

Several birds in scrub habitat adjacent to rocky massif on Mt Chitagal and particularly common in scrub habitat between evergreen forest patches on the Njesi Plateau (8 dates total).

Familiar Chat *Cercomela familiaris*

Single birds seen in scrub habitat between evergreen forest patches on Mt Sanga (17th November) and the Njesi Plateau (20th November)

Arnott's Chat *Pentholaea arnotti*

Single bird seen in miombo at base of Mt Chitagal on 12th November

Mocking Cliff-chat *Thamnolaea cinnamomeiventris*

A pair was seen on the rocky massif at the top of Mt Chitagal on 11th November. Curiously absent from rocky areas on top of Mt Sanga despite much apparently suitable habitat. Absence on the Njesi Plateau probably due to lack of suitable rocky habitat

Evergreen Forest Warbler *Bradypterus lopezi*

Commonly encountered on 19 dates in the understorey of evergreen forest at Mt Chitagal, Mt Sanga and the Njesi Plateau. Highly vocal throughout the day at all three sites.

Little Rush Warbler *Bradypterus baboecala*

One bird calling from river edge vegetation by village at base of Mt Sanga on 19 November.

Marsh Warbler *Acrocephalus palustris*

A single bird seen and photographed in rank vegetation by a small pool at the foot of Mt Sanga on the 19th November.

Hippolais sp. *Hippolais sp.*

Single bird seen briefly and in poor light in evening on Mt Sanga on the 13th November. Possibly Olive-tree Warbler (*H. olivetorum*)

Dark-capped Yellow Warbler *Iduna natalensis*

Commonly observed and heard singing on the Njesi Plateau (up to 5 individuals daily) but absent at other sites.

Willow Warbler *Phylloscopus trochillus*

Seen and heard singing and calling relatively frequently (9 dates) at all three sites. Occurring in both miombo woodland and evergreen forest patches. On 16th November, 3 individuals, perhaps newly-arrived migrants, were seen actively foraging in low scrubby vegetation amongst rocks near top of Mt Sanga.

Blackcap *Sylvia atricapilla*

Small numbers seen on 22nd, 23rd and 24th November at the edge of evergreen forest patches on the Njesi Plateau. These represent only third reports of this species for Mozambique. However, this presumably reflects low observer effort in the area rather than genuine rarity and is a minor extension to the species wintering distribution. See "notable records" for more details.

Garden Warbler *Sylvia borin*

Commonly recorded (11 dates) at edge of evergreen forest patches on both Mt Sanga and the Njesi Plateau. On the Njesi Plateau this species outnumbered Blackcaps approximately 10:1.

Red-faced Cisticola *Cisticola erythrops*

Recorded at Mt Sanga and the Njesi plateau. Birds from Sanga were in scrub at the base of the mountain, but the species was common and highly vocal on the Njesi plateau in mixed grassland/scrub with at least five territories in the immediat vicinity of our camp.

Lazy Cisticola *Cisticola aberrans*

Relatively common on Mt Chitagal and Mt Sanga in suitable habitat, with up to four territorial birds observed close to our camps.

Yellow-breasted Apalis *Apalis flavida*

Recorded in riparian forest patches at Mt Chitagal only, where apparently uncommon with single individuals (possibly the same territorial birds) seen on 7th and 8th November.

Black-headed Apalis *Apalis melanocephala*

Common at all sites, particularly on Mt Chitagal and Mt Sanga, perhaps due to taller forest structure at these sites than on the Njesi plateau. A family with 3 recently fledged young was seen at Mt Sanga.

Tawny-flanked Prinia *Prinia subflava*

Commonly recorded at all sites up to high elevations although most common at Njesi, probably owing to the extent of scrubby habitat present which this species prefers.

Red-winged Warbler *Heliolais erythropterus*

Common on Mt Chitagal and Mt Sanga with multiple (up to 4) territorial birds recorded daily. Present and vocal in scrubby grasslands/edges of woodland. Not recorded on Njesi.

Yellow-bellied Eremomela *Eremomela icteropygialis*

Pairs recorded twice at the base of Mt Chitagal in miombo woodland on 6th and 12th November. Likely to be recorded more frequently with greater survey effort in miombo woodland.

Green-backed Camaroptera *Camaroptera brachyura*

Frequently recorded at all sites (9 dates) but never particularly common with one or two birds observed daily. Observed in understorey of clearings in evergreen forest such as treefalls/forest edges.

Stierling's Wren-warbler *Calamonastes stierlingi*

Commonly recorded in suitable habitat (6 dates) in miombo woodland on the lower slopes of both Mt Chitagal and Mt Sanga with up to four territorial individuals on a given day. Greater survey effort in this habitat would have likely have revealed it to be more abundant.

African Tailorbird *Artisornis metopias*

Commonly recorded at Mt Chitagal and the Njesi Plateau (11 dates) though curiously absent from Mt Sanga. Highly vocal and territorial in understorey of evergreen forest patches. See "notable records" for more details.

Long-billed Tailorbird *Artisornis moreaui*

IUCN Red List 'Endangered'. Commonly recorded in evergreen forest patches on Mt Chitagal, Mt Sanga and the Njesi plateau (17 dates) . Highly vocal and territorial. See "notable records" for more details.

Yellow-bellied Hyliota *Hyliota flavigaster*

2+ birds seen in miombo woodland near base of Mt Chitagal on 6th November with a second sighting also in miombo woodland at the base of Mt Chitagal on 12th November.

Ashy Flycatcher *Muscicapa caerulescens*

One bird seen and heard singing on edge of riparian forest near top of Mt Sanga on 16th November.

Spotted Flycatcher *Muscicapa striata*

One bird seen in a miombo-farmland mosaic habitat at the base of Mt Sanga on 13th November.

African Paradise-flycatcher *Terpsiphone viridus*

Seen and heard relatively frequently (8 dates) in evergreen forest on Mt Chitagal, Mt Sanga and the Njesi Plateau.

White-tailed Crested Flycatcher *Elminia albonotata*

Commonly seen and heard (14 dates) in canopy, midstorey and occassionally understorey of evergreen forest patches of all three sites.

Dark Batis *Batis crypta*

A new national record from Mozambique. One female caught in mistnet set up in understorey of evergreen forest patch on the top of Mt Chitagal on 10th November. This species was previously known from montane forests in Tanzania and extreme north-west Malawi. See "notable records" for more details.

Pale Batis *Batis soror*

One bird seen in miombo woodland at base of Mt Chitagal on 7th November and two birds seen on Mt Chitagal on 9th November. Male and female seen at edge of evergreen forest patch on Mt Sanga on 16th November.

Black-throated Wattle-eye *Platysteira peltata*

Birds seen on Mt Chitagal and Mt Sanga (4 dates total) in evergreen forest patches. This included a pair at a nest at Mt Chitagal and another nest found on Mt Sanga.

Black-backed Puffback *Dryoscopus cubla*

Commonly recorded (19 dates) at all three sites in both evergreen forest patches and miombo woodland. Highly vocal.

Brubru *Nilaus afer*

Single birds heard calling from miombo woodland at bases of Mt Chitagal (12th November), Mt Sanga (19th November) and the Njesi Plateau (25th November).

Tropical Boubou *Laniarius major*

Commonly recorded on all days (20 dates) at each of the three sites. Highly vocal and occurring in both miombo woodland and evergreen forest patches.

Orange-breasted Bush-shrike *Chlorophonus sulfureopectus*

Regularly heard (10 dates) at each of the three sites, calling particularly from the edge habitats in evergreen forest patches.

Brown-crowned Tchagra *Tchagra australis*

2-3 heard calling from degraded miombo edge near base of Mt Chitagal (6 November) and from scrub habitat between evergreen forest patches on Njesi plateau (24 November).

Black-crowned Tchagra *Tchagra senegala*

Frequently recorded (8 dates) from miombo woodland at base of Mt Chitagal and Mt Sanga. Not recorded from the top of any of the three sites. A song resembling this species from evergreen forest at the top of Mt Sanga was probably a Red-capped Robin chat imitating this species' vocalisation.

Retz's Helmetshrike *Prionops rentzi*

A group of at least 5 birds seen moving through miombo woodland approximately half way up Mt Sanga on 13th November.

Violet-backed Starling *Cinnyricinclus leucogaster*

Commonly recorded in canopy of evergreen forest patches at all three sites (12 dates). Particularly large flocks 20-30 birds seen at Mt Chitagal. Given this species is known to be an intra-African migrant and the species was not recorded at Mt Chitagal by Ryan & Spottiswoode during their 2001 visit it may be that this species' occurrence in the area is seasonal.

Red-winged Starling *Onychognathus morio*

Recorded frequently (6 dates) over and around rocky massifs at tops of Mt Chitagal and Mt Sanga. Not recorded on the Njesi Plateau presumably due to lack of suitable rocky habitat.

Scarlet-chested Sunbird *Chalcomitra senegalensis*

Several seen at edge of miombo woodland near base of Mt Chitagal on 6th, 7th and 11th November.

Olive Sunbird *Cyanomitra olivacea*

Commonly recorded (19 dates) in evergreen forest patches at all three sites. Very vocal, giving musical cascading song as well as simple, repetitive calls.

Collared Sunbird *Hedydipna collaris*

Commonly recorded (11 dates) in evergreen forest patches at all three sites.

Miombo/Forest Double-collared Sunbird *Cinnyris manoensis/fuelleborni*

Relatively frequent (6 dates) on Mt Chitagal, Mt Sanga and the Njesi Plateau. Mostly seen at edge of evergreen forest and in adjacent scrub habitat. Birds were not seen or photographed well enough to permit definite separation between Miombo and Forest Double-collared Sunbirds.

African Yellow White-eye *Zosterops senegalensis*

Commonly recorded (11 dates) in canopy and midstorey of evergreen forest patches at Mt Chitagal, Mt Sanga and the Njesi Plateau. This species was particularly numerous at the latter site.

Yellow-throated Petronia *Gymnoris superciliaris*

One bird heard calling from miombo woodland near base of Mt Chitagal on 12 November.

Spectacled Weaver *Ploceus ocularis*

Commonly seen and heard at all three sites (17 dates) in edge habitats around the evergreen forest patches. Several nests were found (see "nest records" for more details).

Village Weaver *Ploceus cucullatus*

Approximately 10 birds at nests along a river by the village at the base of Mt Sanga on 19th November.

Bertram's Weaver *Ploceus bertrandi*

Birds seen at the edge of evergreen forest patches on the Njesi Plateau only (4 dates). Mostly seen as pairs moving through canopy and midstorey. See "notable records" for more detail.

Dark-backed Weaver *Ploceus bicolor*

Commonly seen and heard (11 dates) in canopy of evergreen forest patches at Mt Chitagal and Mt Sanga, though apparently absent from the Njesi Plateau. Very vocal at both Mt Chitagal and Sanga.

Yellow Bishop *Euplectes capensis*

Approximately 5-7 birds (including breeding plumage males) seen in tall grass bordering river on hike up (7th November) and down (12th November) Mt Chitagal.

Black-winged Bishop *Euplectes hordeaceus*

Flocks of 10-20 non-breeding plumage birds commonly seen (11 dates) in dry grassland and scrub between evergreen forest patches on Mt Chitagal, Mt Sanga and the Njesi Plateau.

Orange-winged Pytilia *Pytilia afra*

One bird photographed in tree near village at base of Mt Sanga on 19th November.

Green Twinspot *Mandingoa nitidula*

Two birds were observed and photographed foraging in the mid-storey of the 'upper forest' on Mt Chitagal on the 11th November. See "notable records" for more details.

Red-faced Crimsonwing *Cryptospiza reichenovii*

Recorded only on Mt Chitagal with small flocks (up to 15 birds) recorded on 8th, 9th and 11th November in riparian forest. Multiple birds captured on the 8th were immature birds and had presumably fledged locally.

Jameson's Firefinch *Lagonosticta rhodopareia*

Small groups (up to 6 birds) recorded on Mt Sanga and the Njesi Plateau (6 dates). Usually moving through understorey at forest edge and in adjacent low bushes on rocky outcrops.

Bronze Mannakin *Spermestes cucullatus*

Only recorded at the foot of Mt Sanga with a small flock of 8+ birds observed in scrubby habitat on 19th November.

Yellow-bellied Waxbill *Coccopygia quartinia*

A single observation of a group of 5 birds at edge of evergreen forest patch on Mt Sanga on 16th November.

Common Waxbill *Estrilda astrild*

Groups of up to 15-20 birds relatively common on Mt Chitagal and the Njesi Plateau (8 dates).

Purple Indigobird *Vidua purpurascens*

Small flock of non-breeding plumage birds (at least 5) were present and photographed in scrub vegetation close to the village at the base of Mt Sanga on 19 November.

Pin-tailed Whydah *Vidua macroura*

3 birds (including a breeding plumage male) seen in scrub habitat near village at base of Mt Sanga on 19th November.

Yellow-fronted Canary *Crithagra mozambica*

A single bird and a pair seen at the foot of Mt Sanga on the 13th and 19th November in scrubby habitat.

Brimstone Canary *Crithagra sulphurata*

Recorded on the Njesi Plateau only where single birds were noted on the 23rd and 24th November feeding in a mixed flock of Bishops, Firefinches and Waxbills

Southern Citril *Crithagra hyposticta*

Commonly recorded on all peaks (11 dates), generally in small group (2-5), but up to c.35 birds on Mt Sanga on the 21st Nov. See "notable records" for more details.

Vincent's Bunting *Emberiza vincenti*

A single individual was seen on the rocky peak of Mt Chitagal by Merlijn Jocque on 11th November. Several individuals were seen on the rocky top of Mt Sanga between 14th and 18th November. Our records represent the fourth and fifth localities for this species in Mozambique. See "notable records" for more details.

Cabanis's Bunting *Emberiza cabanisi*

Recorded at all sites (10 dates), but mostly on Mt Chitagal and the Njesi Plateau with the single Mt Sanga record only coming from lower altitude during transit up the mountain.

Breeding birds

Table. 1.2 Nest records of breeding birds.

Name	Site	Date	Stage	Notes/description
Black-throated Wattle-eye *Platysteira peltata*	Mt Chitagal	09/11/16	Nest-building	Pair observed building the early stages of the nest in a small fork on a branch c15m up a tree in riverine patch.
Freckled Rock Nightjar *Caprimulgus tristigma*	Mt Chitagal	11/11/2016	Large chicks	A 'nest' containing two well feathered chicks (primaries in pin) found on a lichen covered rock after adult was flushed by the guide at the base of the rocky outcrop to the north of main forest patch on the mountain
Black-throated Wattle-eye *Platysteira peltata*	Mt Sanga	14/11/16	Incubating	Tim van Berkel found a bird on the nest incubating c 10-12 up a tree. Restircted views so other info is limited.
Little Greenbul *Eurillas virens*	Mt Sanga	14/11/16	Young chicks	Found by mist-netting site. Small cup c 4inches aove ground with 3 chicks of anout 2 days old. Parent often still incubating. Still alive and being fed when we left the mountain 5 days later (Figure 1.1).
Columbid sp.	Mt Sanga	14/11/16	Young chicks	Mac Stone found and photographed a dove/pigeon sp nest in a lower forest patch but no adult was observed an chics un-idable. Nest appeared to have been predated as no sign of young on a subsequent visit 4 days later
Forest Weaver *Ploceus bicolor*	Mt Sanga	18/11/16	Nest-building	Mac Stone found and photographed a pair building the nest in a forest patch below the summit
Red-throated Wryneck *Jynx ruficollis*	Mt Sanga	19/11/16	Nest tending	Single bird seen attending a nest hole with chicks heard inside at the foot of Mt Sanga
Freckled Rock Nightjar *Caprimulgus tristigma*	Njesi Plateau	22/11/16	Young chicks	Merlijn Jocque and Lore Geerhart found an adult and one young chick on a rock amid the grassland close to camp

Table. 1.2 cont Nest records of breeding birds.

Name	Site	Date	Stage	Notes/description
White-tailed Crested Flycatcher *Elminia albonotata*	Njesi Plateau	22/11/16	Incubating	Small cup nest with incubating bird found by Mac Stone, with two eggs
Spectacled Weaver *Ploceus ocularis*	Njesi Plateau	23/11/16	Tending or building	Pair seen either tending chicks of building the nest in a riparian patch

Table. 1.3 Locally fledged juvenile birds and captured brooding birds

Name	Site	Date	Stage	Notes
Southern Citril *Crithagra hyposticta*	Mt Chitagal	8/11/2016	Recently incubating	A female captured with a recovering brood patch, presumably recently incubating
Red-faced Crimsonwing *Cryptospiza reichenovii*	Mt Chitagal	8/11/2016	Fledged young	Several immature birds undertaking post-juvenile (PF) moult captured within a mixed flock with adult birds. Adult female birds in this flock also with recovering brood patches.
Dark Batis *Batis crypta*	Mt Chitagal	10/11/2016	Recently incubating	Female captured with recovering brood patch, presumably recently incubating
Little Greenbul *Eurillas virens*	Mt Chitagal	10/11/2016	Recently incubating	Adult female with recovering brood patch, presumably recently incubating
White-tailed Crested Flycatcher *Elminia albonotata*	Mt Chitagal	10/11/2016	Incubating	Adult female with recovering brood patch, presumably about to begin incubating
Lanner Falcon *Falco biamarcus*	Mt Sanga	13-19/11/16	Fledged young	Family party (1ad and 2 juvs) seen daily on Mt Sanga summit
Olive Sunbird *Cyanomitra olivacea*	Mt Sanga	16/11/16	Fledged young	Adult Olive Sunbird seen feeding a fledged begging chick at the edge of a forest clearing.

Table. 1.3 cont. Locally fledged juvenile birds and captured brooding birds

Name	Site	Date	Stage	Notes
Black-headed Apalis *Apalis melanocephala*	Mt Sanga	16/11/16	Fledged young	1+ adults seen feeding 3 continually begging young as the party foraged in the canopy.
Little Greenbul *Eurillas virens*	Njesi Plateau	23/11/16	Fledged young	A young bird captured undertaking its post-juvenile (PF) moult, probably initiated relatively recently before given extent of juvenile feathering on the bird.
Olive-headed Greenbul *Arizelolocichla olivaceiceps*	Njesi Plateau	23/11/16	Incubating	An adult female was captured with a well-developed brood patch (wrinkled, but not fully vascularised), bird probably incubating.

Figure 1.1 Little greenbul *Eurillas virens* tending a nest of three chicks on Mt Sanga on 14th November 2017. (Picture: Mac Stone)

Mist-netting

Below we present morphometrics from al captured birds from mist-netting activities during the expedition. Further notes and details on each capture are available on request as well as photographs of each capture and blood/feather samples (where available as noted-see below). Cloacal protuberances (CP) were scored from 0-3 as per scores used by the British Trust for Ornithology (BTO), where 0= not present and 3=strongly enlarged/bulbous. Brood patches (BP) were also scored via BTO reccomendations where 0=not present, 1=losing feathers on the breast, 2=significant feather lost on breast, but skin defined, 3=skin vascularised and engorged, 4=skin with thin wrinkles and stretches but losing swelling and 5=feathering over. Body moult was scored between 0-4, where 0=none, 1=trace (<5%), 2=light (5-20%), 3=medium (20-60%), 4=heavy (60+%). Flight feather moult was scored as N=None, A=Advantageous (typically replacing a dropped feather/not symmetrical) and S=symmetrical, where moult scores were also taken (not presented here). Site names are abbreviated as NP (Njesi Pleateau), Sa (Mt Sanga) and Ch (Mt Chitagal). Reference material in the form of Photos (P), Feathers (F) and Blood (B) is also denoted as collected or not (Y/N).

Table. 1.4 Mist-netting data from all captures during the expedition.

Site	Date	Name	Age	Sex	CP	BP	Body Moult	FF Moult	Max Tarsus (mm)	Wing (mm)	Tail (mm)	Mass (g)	Bill Width (mm)	Bill Depth (mm)	Bill-Nares (mm)	Bill-Skull (mm)	P	F	B
NP	21/11	*Artisornis moreaui*	Ad	U	0	0	0	N	22.7	50	55	10.2	3.1	2.7	8.8	17.8	Y	Y	Y
NP	21/11	*Artisornis moreaui*	Ad	U	0	0	2	N	23	46	49	8.7	2.8	2.3	7.9	16.7	N	Y	N
NP	21/11	*Artisornis metopias*	Ad	U	0	0	2	A	24.9	50	41	9.2	3.1	2.4	7.8	14.3	Y	Y	Y
NP	23/11	*Eurillas virens*	Ad	U	0	0	0	N	24.2	87	85	27.8	4.2	4.2	7.9	14.2	Y	Y	Y
NP	23/11	*Bradypterus lopezi*	Ad	M	2	0	0	N	27.7	62	63	22.5	3.2	3.4	8.8	16.3	Y	Y	Y
NP	23/11	*Artisornis metopias*	Ad	U	0	0	0	S	24.2	47	-	8	2.6	2.3	7.4	13.3	Y	Y	Y
NP	23/11	*Artisornis metopias*	Ad	M	1	0	0	S	25.6	51	-	8.9	2.4	2.4	7	16.5	Y	Y	Y
NP	23/11	*Arizelolocichla olivaceiceps*	Ad	F	0	2	0	N	28.1	90	88	38.8	3.8	4.5	10.8	19.3	Y	Y	Y
NP	23/11	*Eurillas virens*	?	U	0	1	0	N	24.1	82	81	22.1	4.3	4.4	7.2	13.8	Y	Y	Y
NP	23/11	*Eurillas virens*	?	U	0	1	0	N	22.2	81	82	20.9	4.3	4	7.2	13.1	Y	Y	Y
NP	23/11	*Eurillas virens*	?	U	0	1	0	N	22.4	82	78	22	4.1	4	7.2	14	Y	Y	Y
NP	23/11	*Phyllastrephus placidus*	?	U	0	1	1	N	24.5	75	78	22.7	4.2	4	9.4	17.1	Y	Y	Y
NP	23/11	*Eurillas virens*	Jv	U	0	0	4	N	23.2	78	-	21.3	3.9	3.6	7.2	12.9	Y	N	N
NP	24/11	*Artisornis moreaui*	Ad	F?	0	0	2	A	23.3	46	46	8.9	3.2	2.5	8.3	17.1	Y	Y	Y
NP	24/11	*Artisornis moreaui*	Ad	M?	0	0	1	N	24.2	50	59	9.2	2.9	2.6	8.8	16.2	Y	Y	Y
NP	24/11	*Artisornis moreaui*	Ad	M?	0	0	0	N	24.7	48	56	9.5	2.9	2.5	8.1	15.9	Y	Y	Y
NP	24/11	*Artisornis moreaui*	Ad	F	0	0	0	N	22.1	46	53	8.5	2.3	2.5	7.3	15.2	Y	Y	Y
Sa	14/11	*Cyanomitra olivacea*	Ad	M	0	0	0	N	18.6	59	47	10.2	3.9	3.4	18.5	23.4	Y	Y	Y
Sa	14/11	*Pogonochichla stellata*	Ad	F	0	2	0	N	26.6	75	60	16.8	4.1	3.4	8.2	16.9	Y	Y	Y
Sa	15/11	*Eurillas virens*	Ad	F	0	4	0	N	23.9	79	83	24.8	5	4.6	8	13.8	Y	Y	Y
Sa	15/11	*Cossypha natalensis*	Ad	n/a	0	0	0	N	30.4	89	74	29	4.1	4.5	10.9	17.7	Y	N	Y
Sa	15/11	*Cyanomitra olivacea*	Ad	M	1	0	0	N	18.5	65	59	11.4	3.9	3.3	18.2	24	Y	Y	Y
Sa	15/11	*Cossypha heuglini*	Ad	n/a	0	0	0	N	33.3	89	84	32.2	3.9	4.4	9.6	16.9	Y	Y	Y
Sa	15/11	*Cossypha natalensis*	Ad	n/a	2	0	0	N	33.6	100	83	39	4.6	4.8	11.1	19.4	Y	Y	Y
Sa	15/11	*Artisornis moreaui*	Ad	?	0	0	1	N	22.5	46	47	8.5	2.8	2.3	8.2	16.9	Y	Y	Y

Sa	15/11	*Artisornis moreaui*	Ad	?	0	0	0	N	24.2	49	55	9.7	2.8	2.5	8.1	17.2	Y	Y	Y
Sa	16/11	*Eurillas virens*	Ad	M	2	0	0	N	24.4	87	83	25.3	4.7	4.5	7.8	13.4	Y	Y	Y
Sa	16/11	*Phyllastrephus placidus*	Ad	F	0	4	2	S	26.3	78	77	24.9	4.2	4.4	10.2	17	Y	Y	Y
Sa	17/11	*Artisornis moreaui*	Ad	M?	0	0	2	N	23.7	52	58	10.4	2.9	2.7	8.3	16.1	Y	Y	Y
Sa	17/11	*Artisornis moreaui*	I?	M?	0	0	4	N	24.3	49	56	n/a	2.9	2.5	9.4	17.4	Y	Y	Y
Sa	18/11	*Artisornis moreaui*	I?	M?	0	0	1	N	23.6	50	58	n/a	2.8	2.4	8.7	15.9	Y	Y	Y
Ch	08/11	*Cryptospiza reichenovii*	I	M	0	0	4	N	20.6	55	n/a	12.9	6.8	6.6	8.6	10.6	Y	Y	Y
Ch	08/11	*Modulatrix orostruthus*	Ad	?	2	1?	1	N	31.4	85	68	30.1	3.7	4.1	9.8	20.2	Y	N	Y
Ch	08/11	*Pogonochichla stellata*	Ad	?	1	0	0	N	27	83	68	17.7	4.4	3.5	9	15.1	Y	Y	Y
Ch	08/11	*Modulatrix orostruthus*	Ad	?	0	0	0	A	30.8	86	70	32.8	3.6	4.2	10.2	19	Y	N	Y
Ch	08/11	*Cryptospiza reichenovii*	Ad	M	0	0	2	N	20.3	55	42	13.8	6.8	6.5	8.8	11.7	Y	Y	Y
Ch	08/11	*Cryptospiza reichenovii*	Ad	F	0	5	4	N	20.6	56	41	12.6	5.8	6.6	8	10.2	Y	Y	Y
Ch	08/11	*Cryptospiza reichenovii*	I	F	0	0	4	S	19.3	55	40	13.1	5.9	6.5	8.2	10.2	Y	Y	Y
Ch	08/11	*Cryptospiza reichenovii*	I	M	0	0	4	N	19.7	55	42	12.4	6.5	6.5	8.6	11.7	Y	N	N
Ch	08/11	*Cryptospiza reichenovii*	I	F	0	0	4	N	21.2	55	43	13.4	5.7	6.7	8.4	12.2	Y	N	N
Ch	08/11	*Cryptospiza reichenovii*	Ad	M	0	0	3	S	19.5	55	44	n/a	6.3	6.5	8.4	11.2	N	N	N
Ch	08/11	*Cryptospiza reichenovii*	I	M	0	0	4	N	20.3	54	41	12.1	6.3	5.7	8.3	11.3	Y	N	N
Ch	08/11	*Cryptospiza reichenovii*	I	M	0	0	4	N	19.4	56	n/a	n/a	6.1	6.3	8	11.4	N	N	N
Ch	08/11	*Cryptospiza reichenovii*	I	F	0	0	3	N	20.1	53	41	12.3	5.9	6.8	8.6	11	Y	N	N
Ch	08/11	*Phyllastrephus placidus*	Ad	F	0	5	1	S	25.7	73	77	21.9	4.1	4.4	9.8	16.4	Y	Y	Y
Ch	08/11	*Phyllastrephus placidus*	I	?	0	0	1	N	26.5	78	85	25.1	4.4	4.5	10.3	17.9	Y	Y	Y
Ch	08/11	*Crithagra hyposticta*	Ad	F	0	5	0	N	16.8	67	51	13.5	5.3	6.4	8.4	12.1	Y	Y	Y
Ch	08/11	*Turtur tympanistra*	I	?	0	0	3	S	24.1	113	85	62.5	2.9	3.4	7.4	16.1	Y	Y	Y
Ch	08/11	*Ploceus ocularis*	Ad	M	0	0	1	N	26.2	78	60	24.6	5.7	6.3	12.2	18.7	Y	Y	Y
Ch	09/11	*Artisornis metopias*	Ad	F?	0	0	3	A	23.5	47	37	8.3	2.6	2.2	6.5	13.4	Y	Y	Y
Ch	09/11	*Artisornis metopias*	Ad	M	0	0	1	N	24.9	51	42	9.1	2.6	2.5	7.5	16	Y	Y	Y
Ch	10/11	*Batis crypta*	Ad	F	0	4	0	N	23.3	65	40	n/a	4.3	3.5	6.5	15	Y	Y	Y
Ch	10/11	*Eurillas virens*	Ad	F	0	4	0	N	24.3	81	86	23.1	4.5	4.3	7.7	14.1	Y	Y	Y
Ch	10/11	*Elminia albonotata*	Ad	F	0	2	0	N	19.2	62	80	9.6	4	2.2	6	12.6	Y	Y	N
Ch	10/11	*Artisornis moreaui*	Ad	M	0	0	2	A	24.3	50	60	10.1	3.2	2.5	8.5	15.4	Y	Y	Y

Figure 1.2. Long-billed Tailorbird *Artisornis moreaui***,** Njesi Plateau, 24 November 2016. One of Africa's rarest and poorest known birds and one of the key focal species of the expedition. We were pleased to find the Long-billed Tailorbird to be relatively common in all suitable habitat surveyed (Picture: Sam Jones).

Figure 1.3. **Dapplethroat** *Modulatrix orostruthus***,** Mount Chitagal, 8 November 2016. A significant range extension of this highly range restricted species (Picture: Sam Jones)

Figure 1.4. Dark Batis *Batis crypta***,** Female, Mount Chitagal, 10 November 2016. The first record of this species for Mozambique (Picture: Gabriel Jamie)

Figure 1.5. African Tailorbird *Artiosornis metopias*, Mount Chitagal, 9 November 2016. Common in suitable habitat on both Mt Chitagal and the Njesi Plateau, but surprisingly absent on Mt Sanga (Picture: Gabriel Jamie)

2. Mammals

Tim van Berkel

Little comparative mammal data is available from other surveys on Mozambiques mountains. Some occurence data however, has been compiled from Mts Inago, Namuli, Mabu and Chiperone (Bayliss et al. 2010, 2014; Dowsett-Lemaire & Dowsett 2009; Timberlake et al 2007, 2009, 2012). The only information on mammal presences in our study area are anecdotal reports in Ryan & Spottiswoode (2003), who reported the presence of African Elephants *Loxodonta africana* in the highlands and Lion *Panthera leo*, Leopard *P.pardus*, Eland *Taurotragus oryx*, Sable Antelope *Hippotragus niger* and *Zebra Equus crayshawi* from the general area based upon spores and reports from local people. Even though subsistence hunting of mammals is illegal, it still occurs widely in Northern Mozambique, specifically affecting large herbivores and carnivores. Targeted mammal surveys throughout Mozambique's mountains are limited and little is known about specific mammal diversity patterns in the region with only anecdotal records from our study sites. The aim of the mammal surveys was thus to identify as many small and large species of terrestrial mammal as possible. To this extent, four survey methods were used to target different mammal communities. Anecdotal data was also collected on the extent of poaching on each mountain (through evidence such as hunting platforms and snares).

1. Camera Traps

Fifteen cameras (4 Bushnell Trophy Cam Agressor and 11 Bushnell Trophy Cam HD) were deployed with the main aim of surveying elusive and nocturnal medium- to large -sized terrestrial mammals. Camera traps are most useful in restricted environments such as forests where mammals are more likely to pass a camera. In open areas such as grassland and savannah this method can be less suitable due to animals' more randomised movement. Accordingly, camera traps in this survey were deployed mainly in forests, with a small number in grassland and rocky areas. Trap locations were selected around traces of animal activity, such as trails, drinking locations and middens. Camera traps were placed about 40cm off the forest floor and set to highest sensitivity to maximise the detection probability. We elected for a combination of video and photo captures depending on expected exposure time of passing animals.

Total survey effort amounted to 105 camera trap days (Table 2.1). In Chitagal, cameras were located in riverine forest (N=7), montane forest (N=7) and savannah grassland (N=1). In Sanga cameras were located in montane forest (N=8) and on rocky outcrops (N=2). At the Njesi Plateau cameras were located in montane forest (N=3), riverine forest (N=2), scrub (N=5) and on rocky outcrops in grassland (N=2)

Table 2.1 Camera trap survey effort with the total number of camera traps, total survey time in days and exact survey days, on the three surveyed sites.

Site	# cameras	Days	Survey Period
Chitagal	15	35	07 Nov – 11 Nov 2016
Sanga	10	38	14 Nov – 18 Nov 2016
Njesi	12	32	21 Nov – 24 Nov 2016

2. Small mammal trapping (Sherman traps)

Small mammal traps were used to catch terrestrial rodents. Thirty Sherman traps (twenty 7.6 x 9 x 23 cm and ten 5 x 6 x 17 cm) were baited with a mixture of peanut butter, oats, water and vegetable oil, rolled into small balls. Baited traps were deposited in grassland and forest to sample rodent assemblages across habitats. Four traps were placed in vegetation between 1-2m of the forest floor on Njesi.

3. Pitfall Traps

Pitfall traps were used to catch shrews and other small rodents. See chapter-2 on Herpetofauna for a description of the pitfall trap setup.

4. Opportunistic observations and visual encounter surveys

Opportunistic visual encounter surveys were employed to observe nocturnal and arboreal species that would otherwise not be recorded using the other methods. Any signs of mammal spoors were also recorded opportunistically. These include tracks, skulls, hairs and scat which were collected where possible.

Identification

Where necessary, species were identified with the use of Stuart's Field Guide to Mammals of Southern Africa (Stuart & Stuart 2015). Specimens of small mammals were identified by Dr. Rainer Hutterer of the Zoological Research Museum Alexander Koenig in Bonn, Germany.

Results: Small Mammals

A total of 17 individuals were captured using small mammal traps, pitfall traps and through opportunistic sampling. Identification of some species are ongoing as identification in the field was non-conclusive for all but two species. Collected, unidentified specimens comprised three species of shrew and four species of murid (Table 2.2). Two of the murids (one on Mt Chitagal, one on Mt Sanga) were caught using small mammal traps, giving a trap success of 0.6% (see Table 2.3). None of the traps failed and bait never disappeared from traps or was eaten by ants, termites or other non-target species. Pitfall trapping proved to be more successful than small mammal trapping; a total of 12 specimens; 11 shrews and one murid, were trapped. In addition, three murids were collected opportunistically from the field and one species, the Four-toed Sengi (*Petrodromus tetradactylus*) was recorded by a camera trap in a patch of forest on the Njesi Plateau.

Table 2.2 Small mammal species recorded with independent locations noted per species (duplicated records of species at the same location are denoted in the Species column). Pf = Pitfall, Sm = Small Mammal Trap, Op = Opportunistic sampling, CT = Camera Trapping.

Species	Common Name	Location	Altitude	Habitat	Method
Crocidura cf. hildegardeae (n=2)	-	Chitagal	1417	Riverine Forest	Pf
Crocidura cf. hildegardeae	-	Sanga	1686	Afromontane Forest	Pf
Crocidura luna (n=6)	Greater Grey-brown Musk Shrew	Sanga	1686	Afromontane Forest	Pf
Grammomys sp	Thicket Rat sp	Chitagal	1438	Riverine Forest	Sm
Grammomys sp	Thicket Rat sp	Sanga	1686	Afromontane Forest	Pf
Grammomys sp	Thicket Rat sp	Sanga	1705	Afromontane Forest	Sm
Mus triton	Grey-bellied Pygmy Mouse	Sanga	1773	Rocky outcrop	Op
Mus minutoides	Pygmy Mouse	Sanga	1035	Agriculture/de-graded miombo	Op
Mus minutoides	Pygmy Mouse	Njesi	1830	Rocky outcrop	Op
Suncus cf. sorella	-	Njesi	1777	Riverine Forest	Pf
Petrodromus tetradactylus	Four-toed Sengi	Njesi	-	Afromontane Forest	CT

Table 2.3 Sherman trap survey effort in number of trap nights in the different habitats on the three study sites.

Site	Afromontane Forest	Riverine Forest	Grassland	Survey period
Chitagal	0	75	45	07 Nov – 11 Nov 2016
Sanga	60	0	60	14 Nov – 18 Nov 2016
Njesi	60	0	60	21 Nov – 24 Nov 2016
Total	120	75	165	07 Nov-24 Nov 2016

Both *Grammomys* species caught in small mammal traps and caught in a pitfall trap on Mt Sanga belong to this genus, but represent different species. These records form either significant range extensions of known *Grammomys* species, or could be undescribed species.

Of all pitfall trap specimens, only one species, the Greater Grey-brown Musk Shrew (*Crocidura luna*), could be identified in the field. Its identity was confirmed following skull analysis. *C. luna* was also the most commonly trapped species (6 occasions -all on Mt Sanga). One shrew species was collected from the Njesi Plateau, a small species of climbing shrew resembling *Suncus sorella*, which is considered to be a species complex. The third species, collected from Mt Sanga and Mt Chitagal, resembles (but is not identical to) *C. hildegardeae* and could be an undescribed species.

The three specimens obtained opportunistically are all part of the *Mus* genus. Two of the specimens were both identified to be Pygmy Mouse (*M. minutoides*) and its presence in Northern Mozambique is a significant extension of its currently known range. The third specimen remains unidentified, but appears to be part of the *M. callewaerti* species complex.

Results: Large Mammals

A total of 27 large mammal species were recorded from Mount Chitagal (N=18), Mount Sanga (N=17) and the Njesi Plateau (N=7). Table 2.4 lists all records of large mammal species from the expedition. These records include range extensions for five species, including a new country record for Mozambique.

Of these 27 species, nine large terrestrial mammals (as well as one small mammal- the Four-toed Sengi) were identified from camera traps (Table 2.5) from a total of 165 trap nights. No terrestrial birds were recorded using this method but a number of volant birds were identified (See the chapter 1-avifauna).

Notable large mammal observations are listed following the summary table. Several mammal species were recorded through day and night surveys and collection of scat and observation of prints.

Table 2.4 List of large mammals recorded from the three study sites: Chitagal (Ch), Njesi Plateau (Nj), Sanga (Sa). Observation methods: Sp = Spoor, CT = Camera Trap, Pf = Pitfall, Vis = Visual, Skull =Sk. *denotes range extensions.

Common Name	Scientific Name	Ch	Nj	Sa	Elevation	Survey methodology	IUCN Status
Bovidae							
African Buffalo*	*Syncerus caffer*	x			1700	S,V	LC
Klipspringer	*Oreotragus oreotragus*			x	1700	CT,V	LC
Sable Antelope	*Hippotragus niger*	x		x	600	S	LC
Canidae							
Side-striped Jackal	*Canis adustus*		x		1804	CT	LC
Cercopithecidae							
Syke's Monkey	*Cercopithecus mitis*	x		x	1450	V	LC
Vervet Monkey	*Chlorocebus pygerythrus*	x			1450	V	LC
Yellow Baboon	*Papio cynocephalus*	x			600	V	LC
Felidae							
Leopard	*Panthera pardus*			x		S	VU
Galagidae							
Southern Lesser Galago	*Galago moholi*	x		x		V	LC
Thick-tailed Galago	*Otolemur crassicaudatus*			x	1156	V	LC
Herpestidae							
Bushy-tailed Mongoose	*Bdeogale crassicauda*			x	1740	V	LC
Dwarf Mongoose	*Helogale parvula*			x	1740	S	LC
Slender Mongoose	*Herpestes sanguineus*	x				CT	LC
Water Mongoose	*Atilax paludinosus*	x			1156	S	LC
Hyaenidae							
Spotted Hyena	*Crocuta crocuta*	x	x	x		S	LC
Hystricidae							
African Porcupine	*Hystrix africaeaustralis*	x	x			S	LC
Leporidae							
Smith's Red Rock Hare*	*Pronolagus rupestris*			x	1710	CT,S,V	LC
Muridae							
Gambian Giant Pouched Rat	*Cricetomys gambianus*	x	x	x	1030	V, CT	LC
Nandiniidae							
African Palm Civet	*Nandinia binotata*	x		x	Multiple	V	LC
Procaviidae							
Rock Hyrax*	*Procavia capensis*	x		x	Multiple	V	LC
Sciuridae							
Mutable Sun Squirrel	*Heliosciurus mutabilis*	x			1430	V	LC

Table 2.4 cont. List of large mammals recorded from the three study sites: Chitagal (Ch), Njesi Plateau (Nj), Sanga (Sa). Observation methods: Sp = Spoor, CT = Camera Trap, Pf = Pitfall, Vis = Visual, Skull =Sk. *denotes range extensions.

Common Name	Scientific Name	Ch	Nj	Sa	Elevation	Survey methodology	IUCN Status
	Suidae						
Bushpig	*Potamochoerus larvatus*	x	x	x	Multiple	CT,S	LC
	Thryonomyidae						
Lesser Cane Rat*	*Thryonomys gregorianus*	x		x	1618	S	LC
	Viverridae						
African Civet	*Civettictis civetta*	x	x	x	Multiple	CT,S	LC
Common Large-spotted Genet	*Genetta maculata*	x	x	x	1600	CT,V	LC

Table 2.5 Mammals recorded on camera traps, with the number of times an animal passed the cameras (events), the total number of recordings (frequency) and the total number of cameras on which it was recorded.

Location	Common Name	Scientific Name	Events	Frequency	Cameras
Chitagal	African Civet	*Civettictis civetta*	1	29	1
	Common Large-spotted Genet	*Genetta maculata*	6	171	4
	Gambian Giant Pouched Rat	*Cricetomys gambianus*	1	29	1
	Slender Mongoose	*Galerella sanguinea*	2	57	2
	Syke's Monkey	*Cercopithecus albogularis*	1	29	1
Sanga	Common Large-spotted Genet	*Genetta maculata*	1	31	1
	Klipspringer	*Oreotragus oreotragus*	5	156	1
	Smith's Rock Rabbit	*Pronolagus rupestris*	2	63	1
Njesi	African Civet	*Civettictis civetta*	1	26	1
	Bushpig	*Potamochoerus larvatus*	1	26	1
	Common Large-spotted Genet	*Genetta maculata*	3	79	3
	Four-toed Sengi	*Petrodromus tetradactylus*	1	26	1
	Gambian Giant Pouched Rat	*Cricetomys gambianus*	2	53	1
	Side-striped Jackal	*Canis adustus*	1	26	1

Notable records

Lesser Cane Rat *Thryonomys gregorianus*

On 14 November 2016 the skull of a lesser cane rat (*Thryonomys gregorianus*) was collected from burnt montane grassland bordered by two woodland patches at 1618m on the ridge of Mt Sanga. The skull was incomplete and partly burnt but identification to genus level was possible, mainly because of the characteristic grooved incisors and skull shape. The skull differs further from the closely related greater cane rat (*T. swinderianus*) in all identifying features that were still distinguishable from the incomplete skull, as described by van de Merwe (2007). In addition, pellets believed to belong to this species were collected from Mt Sanga. This is the first known record of lesser cane rat in Mozambique, extending its known range to the east from Malawi (Hoffmann 2008).

Rock Hyrax *Procavia capensis*

Two groups of rock hyraxes (*Procavia capensis*) were observed on Mt Sanga and Mt Chitagal (Figure 2.1). Both groups were observed on rocky outcrops with burrows at the top of the mountains and numerous droppings at these sites. These records constitute an extension to its known distribution into northern Mozambique.

Figure 2.1. Rock Hyrax *Procavia capensis on* Mt Chitagal (Picture : Mac Stone).

Smith's Red Rock Hare *Pronolagus rupestris*

Smith's red rock hare (*Pronolagus rupestris*) was recorded multiple times on Mt Sanga (Figure 2.2); it was recorded twice on a single camera trap (15 November 2016, 17:57h and 17 November 2016 at 19.50h at 1430m asl), three times during diurnal surveys and once opportunistically after being flushed from tall dried grass bordering a rocky outcrop in the morning around 9.00h. These observations constitute a substantial expansion to its currently known distribution, making it the northernmost record in Mozambique. The most recent IUCN distribution data lists its nearest areas of occurrence in Malawi and Tanzania (Smith & Boyer 2008). However, some recent observations have been made in Mozambique; the nearest record being 365km south of the Serra Jecci on Mt Inago, where it was observed on several occasions (Bayliss et al. 2010). The species was also recently recorded on Mt Mabu

(Bayliss et al. 2014) and Mt Namuli (Timberlake et al. 2009).

Figure 2.2. Smith's Rock Rabbit *Pronolagus rupestris on* Mt Sanga (Picture : Mac Stone).

Syke's Monkey *Cercophitecus mitis*

At least two groups of Syke's Monkey (*Cercophitecus mitis*) were observed in montane forest on Mt Sanga (1660m asl) and in riparian forest on Mt Chitagal, where one individual was also recorded on a camera trap (1412m asl) drinking from a small stream (Figure 2.3). These observations extend the known distribution of *C. mitis* into north-western Mozambique . The species is also known to occur in seemingly isolated populations on Mt Inago, Mt Mabu and Mt Namuli (Timberlake et al. 2009, 2012; Bayliss et al. 2010).

Figure 2.3. Syke's Monkey *Cercophitecus mitis* drinking from a stream on Mt Chitagal (Picture : Camera trap).

African Buffalo *Syncerus caffer*

A single group consisting of three adult African buffalo *(Syncerus caffer)* and one juvenile were observed from a distance in tall grassland near the top of Mt Chitagal. Piles of dry dung and prints were numerous on Mt Chitagal, and the skull of a buffalo killed by local hunters was also encountered on the mountain in a hunting camp. In Northern Mozambique, IUCN data shows African buffalo to be surviving solely in the Niassa Game Reserve as hunting pressure outside the game reserve is probably too high.

African Elephant *Loxodonta africana*

Wide trails made by African elephant (*Loxodonta africana*) were observed in the moist forest on the higher slopes of Mt Sanga. Ryan & Spottiswoode (2003) also reported their presence close to Mt Chitagal. According to the expedition's local guide however, elephants have not been observed here since 2011.

Concluding remarks

Small Mammals

Small mammal capture rates were remarkably low with only two captures in the forest, one in Chitagal and one in Sanga, and none in grassland and rocky outcrops. This could possibly be explained by the fact that it was the end of the dry season, trapping occurred around full moon and the sky was often clear, resulting in very good visibility. The bait used has been used extensively and successfully elsewhere and therefore unlikely to be a cause of the low capture rates. Alternatively small mammal densities may be naturally low. This is a reasonable possibility, especially in grassland areas and rocky outcrops which were recently burned and lacked a lot of vegetation cover, green grass or seeds. Repeated surveys in the wet season would provide an interesting comparison.

Large Mammals

The apparent lack of larger animals, mainly antelopes, on the mountains is also noteworthy. Hunting is known to occur on Mt Chitagal and the Njesi Plateau, especially during the wet season. Snares are particularly prevalent and the main target species are apparently bushpigs, (which use the mountains as part of their migration route in the wet season). Small snares were also observed on the Njesi Plateau, which were set for terrestrial birds such as francolin. Hunting pressure in Chitagal appeared to be relatively low with only two large inactive snares observed in the study area and two small camps observed on our walk in, one of which had the casque of a hunted buffalo. On the other hand, hunting pressure on Njesi seems to be extremely high, with many snares encountered in each forest patch. Well over 30 large and small snares were removed from all areas of forest entered. Hunting here seems unsustainable, exemplified by a lack of signs and records of large mammals and lower density of pig scat compared to Chitagal and Sanga, despite similar survey effort. The difference in hunting pressure could be explained by the remoteness to villages of Chitagal and their proximity to the Njesi Plateau.

Preliminary surveys indicate how more remote parts of these highlands seem to have lower hunting pressure (based on the number of observed snares). The presence of some important distributional

records indicate how little known the mammal fauna of the region is, but a more thorough survey is necessary to understand seasonal differences in large mammals communities here. No evidence was observed of species anecdotally noted as present by Ryan & Spottiswoode (2003), however, but whether this pertains to local extinctions is unknown.

3. Herpetofauna

Justin K. Clause & Merlijn Jocque

Little is known on the amphibians and reptiles of this region. Published reports include Portik et al. (2013) at the Njesi plateau and Branch et al. (2005) from the Niassa Game Reserve. Additional records of the herpetofauna on the mountains of Mozambique are found in the expedition reports of Mt. Mabu (Timberlake et al. 2009), Mt. Namuli (Timberlake et al. 2012), Mt. Chiperone (Timberlake et al. 2007) and Mt. Inago (Bayliss et al. 2010). On this expedition, herpetofauna were surveyed with daily and nightly herpetological surveys, consisting of both visual encounter and active search. Additionally, in each camp, a drift-fence pitfall trap array was placed (for details on the pitfall trap array, see section 4, table 4.2). Specimens were also collected, opportunistically, during the other biodiversity surveys.

In total, 96 herpetological specimens were collected over 17 days of sampling, with at least 23 species confirmed across all three sites (Table 3.1). In addition, two unidentified snakes were observed (but not captured) during the expedition, one on Mt. Sanga and one on Mt. Chitagal. However, as no identification could be made, neither of these individuals were included in the species list. The majority of animals were observed during visual encounter surveys. Pitfall traps provided only three *Arthroleptis xenodactyliodes* at the Njesi plateau. Some specimens were collected from lower elevations before accessing the high elevation mountain-top sites. Due to this bimodal collection, our species list is separated into "High" (over 1,400 m) and "Low" elevation (under 1,400 m). While there were high abundances of several species in all three areas, their distribution was extremely patchy. Most frogs were collected in riparian forests and partially dried wetlands, which is to be expected at the end of the dry season. Lizards were most commonly observed on rocky outcrops scattered through grasslands. Only one lizard (L*ygodactylus regulus*) and two frogs (*Arthroleptis stenodactylus*) were observed in closed canopy forest that was not immediately adjacent to flowing water.

We remain intentionally vague on many anuran identifications due to the high morphological variability in observed frogs. We are currently conducting a genetic analysis of many of the specimens collected. Once this analysis is completed, we will be able to more accurately report the anuran diversity from this region.

Overall, Herpetological activity was very low. Only a single incident of rain was experienced during the whole expedition, on the Njesi plateau. Snakes and chameleons were largely missing from the high elevation sites and frogs were restricted to the previously described wet patches.

Notable records

Agama kirki (Kirk's Rock Agama)

One specimen was found. It was discovered under a rock in an open saddle of recently burned rocky grassland between two peaks at the top of Mt. Chitagal. The exposed loose rocks scattered among grassland was an unusual habitat type in this area. JC026, S 12°35.628' E 035°15.077', 1794 m elev. Mt. Chitagal. 16:30h, 8/Nov/16.

Agama mossambica (Mozambique Agama)

One specimen was found basking on a granite outcrop on the Njesi Plateau. These outcrops were scattered across the area surveyed and were areas of high lizard density. JC088, S 12°49.766' E 035°11.438', 1,799 m elev. Njesi Plateau. 9:30h, 24/Nov/16.

Chamaeleo dilepis (Flapneck Chameleon)

This species was extremely common in low elevations around Mt. Sanga and the Njesi Plateau. Five specimens were collected but only one from over 1,400 m. They were found in riparian vegetation from ground level to the tops of the trees. Locals collected several individuals and so an exact location for these specimens is not known. However, we ascertained that they were collected ca. 300 m from the GPS points listed. JC068, S 12°20.905' E 035°22.608', 1,021 m elev. Sanga Village. 18:00h, 19/Nov/16. JC081, S 12°49.948' E 035°11.215', 1,740 m elev. Njesi Plateau. 14:00h, 22/Nov/16.

Chamaeleo melleri (Meller's Chameleon)

The only individual found was in riparian vegetation adjacent to Sanga Village. Locals found both individuals collected around the Njesi Plateau and so an exact location for these specimens is not known. However, we ascertained that they were collected ca. 300 m from the GPS points listed. JC070, S 12°20.905' E 035°22.608', 1,021 m elev. Sanga Village. 18:15h, 19-Nov-16.

Cordylus meculae (Mecula Girdled Lizard)

Previously, this species was only known from its type locality on Serra Mecula (Branch et al. 2005a,b). We collected individuals from both Mt. Chitagal and Mt. Sanga. The individual collected on Mt. Chitagal was found under a rock in an open saddle of recently burned rocky grassland between two peaks. All Mt. Sanga individuals were found on open granite outcrops among recently burned grassland. Only one individual was observed on Mt. Chitagal but they were extremely common on Mt. Sanga with over ten individuals captured. These new observations add two new localities to the known range C. meculae. These mountains are ca. 260 km West of the type locality and a ca. 500 m increase in elevation. JC027, S 12°35.628' E 035°15.077, 1,794 m elev. Mt. Sanga. 16:30h, 8/Nov/16. JC038, S 12°23.165' E 035°20.005', 1,750 m elev. Mt. Chitagal. 10:45h, 15/Nov/16.

Hemidactylus mabouia (Tropical House Gecko)

This species was common on Mt. Sanga and the Njesi Plateau. Most commonly found in rock outcrops scattered throughout recently burned grasslands. Many nesting sites were found and one on Mt. Sanga was particularly large. When discovered, the nest had ten eggs. Some previously hatched but several still incubating. This unusually large nest size could be due to cooperative breeding. JC037, S 12°23.133' E 035°20.037', 1,734 m elev. Mt. Sanga. 9:35h, 15/Nov/16. JC084, S 12°49.868' E 035°10.919', 1,734 m elev. Njesi Plateau. 10:00h, 23/Nov/16.

Lygodactylus regulus (Prince Dwarf Gecko)

One individual was collected from high elevation, closed canopy, evergreen forest on top of Mt. Sanga. It was discovered under loose bark on the trunk of a fallen tree. This was the only reptile collected from the interior of the forests in any of the three survey locations. JC055, S 12°23.014' E 035°20.113'. Mt. Sanga. 1,667 m elev. 19:00h, 17/Nov/16.

Trachylepis varia (Variable Skink)

This species was also very common on Mt. Sanga and the Njesi Plateau. Its primary habitat was rock outcrops scattered throughout recently burned grasslands. Many unidentified juvenile skinks were also observed on all three peaks and the lowlands between. While it seems likely these are all the same species, we were not able to positively identify the juveniles. JC054, S 12°23.153' E 035°20.337', 1,650 m elev. Mt. Sanga. 17/Nov/16. JC087, S 12°49.897' E 035°10.994', 1,762 m elev. Njesi Plateau. 8:00h, 24/Nov/16.

Crotaphopeltis hotamboeia (White-Lipped Herald Snake)

Two individuals were found: one at low elevation riparian habitat near Sanga Village and a juvenile in high elevation riparian forest on the Njesi Plateau. JC059, S 12°20.905' E 035°22.608', 1,021 m elev. Sanga Village. 21:00h, 19/Nov/16. JC086, S 12°49.948' E 035°11.215', 1,740 m elev. Njesi Plateau. 7:30h, 24/Nov/16.

Lamprophis capensis (Brown House Snake)

Only one individual was found. It was under a small chunk of granite in recently burned grassland on the Njesi Plateau. JC092, S 12°49.793' E 035°10.897', 1,728 m elev. Njesi Plateau. 11:30h, 24/Nov/16.

Arthroleptis cf. xenodactyliodes (Dwarf Squeaker)

The most common species of amphibian found on the expedition. Several individuals were collected from all three study-sites. All specimens were collected in marsh or riparian habitat. However, there is an extreme amount of variation in pattern and color in the specimens collected. We are awaiting genetic analysis to confirm this identification. JC011, S 12° 35.827' E 035° 15.769', 1,425 m elev. Mt. Chitagal. 16:00h, 7/Nov/16. JC050, S 12°22.902' E 035°20.091', 1,670 m elev. Mt. Sanga. 8:25h, 17/Nov/16.

Arthroleptis stenodactylus (Shovel Footed Squeaker)

This was a commonly encountered frog, with four or more observations recorded from all three study-sites at high elevation. This species is an addition to the species list of Portik et al. 2013 within the Njesi plateau. This inconsistent detection between the two expeditions might reflect a seasonal activity pattern of these frogs. This species was also the only amphibian to be found in dry forests. All others were either discovered in marsh or riparian habitat. JC017, S 12° 35.827' E 035° 15.769', 1,425 m elev. Mt. Chitagal. 22:00h, 8/Nov/16. JC046 S 12° 23.016' E 35° 20.077', 1,703 m elev. Mt. Sanga. 10:45h, 16/Nov/16. JC065, S 12°50.375' E 035°11.003, 1,705 m elev. Njesi Plateau. 14:10h, 20/Nov/16.

Schismaderma carens (Red Toad)

One individual was found in low elevation riparian habitat near Sanga Village. JC066, S 12°20.905' E 035°22.608', 1,021 m elev. Njesi Plateau.19:00h, 19/Nov/16.

Amietophrynus maculatus (Flat-backed Toad)

Several Amietophrynus sp. were found during the expedition. However, since the main distinguishing characteristic is vocalization, positive identification was difficult. There were the only two individuals that were seen calling. Identification of the rest of our specimens will not be made until the results of the genetic analysis are examined. All individuals were found in riparian forest or marshy habitat. JC002, S 12° 35.477' E 035° 18.412', 1,035 m elev. Mt. Chitagal. 19:20h, 6/Nov/16. JC003, S 12° 35.477' E 035° 18.412', 1,035 m elev. Mt. Chitagal. 19:25h, 6/Nov/16.

Ptychadena oxyrhynchus (Sharp-nosed Ridged Frog)

Two individuals were found in low elevation riparian habitat near Sanga Village. Only one was collected. JC074, S 12°20.905' E 035°22.608', 1,021 m elev. Mt. Sanga. 18:00h, 19/Nov/16.

Chiromantis xerampelina (Gray Tree Frog)

Only one individual was found at low elevation on the Njesi Plateau. It was collected from a cement irrigation cistern near a dwelling. It had made a large foam nest on the interior of the cistern. JC082, S 12°52.055' E 035°11.084', 1,373 m elev. Njesi Plateau. 13:00h, 22/Nov/16.

Figure 3.1 Left: An adult *Cordylus maculae* collected from Mt. Chitagal. This was the first individual found outside the type locality of Serra Mecula. Right: A recently hatched *Hemidactylus mabouia* perched on its egg. This large of a nest is unusual and may be evidence of cooperative breeding in this species (Pictures: Justin Clause).

Table 3.1 Amphibians and reptiles recorded in the three study sites. Observations are grouped in "High" (over 1,400 m) and "Low" elevation (under 1,400 m).

	Family	Genus	Species	Chitagal	Sanga	Njesi
Anura	Arthrolepidae	*Arthroleptis*	*stenodactylus*	H	H	H
	Arthrolepidae	*Arthroleptis*	*xenodactyliodes*	H	H	H
	Bufonidae	*Amietophrynus*	*maculatus*	L		
	Bufonidae	*Amietophrynus*	*sp.*		H/L	
	Bufonidae	*Schismaderma*	*carens*			L
	Hyperoliidae	*Afrixalus*	*sp.*		L	
	Hyperoliidae	*Hyperolius*	*sp.*	H	H/L	
	Microhylidae	*Unidentified*	*sp.*		L	
	Ptychadinedae	*Ptychadena*	*oxyrhynchus*		L	
	Pyxicedenidae	*Amietia*	*sp.*	L		
	Rhacophoridae	*Chiromantis*	*xerampelina*			L
Sauria	Agamidae	*Agama*	*kirki*	H		
	Agamidae	*Agama*	*mossambica*			H
	Agamidae	*Acanthocercus*	*cf. atricollis*			L
	Chamaeleonidae	*Chamaeleo*	*dilepis*		L	H/L
	Chamaeleonidae	*Chamaeleo/Triceros*	*melleri*		L	L
	Cordylidae	*Cordylus*	*meculae*	H	H	
	Geckonidae	*Hemidactylus*	*mabouia*		H	H
	Geckonidae	*Lygodactylus*	*regulus*		H	
	Scincidae	*Tachylepis*	*varia*	H	H	H
	Scincidae	*Melanoseps*	*sp.*	H	H	
Squamata	Colubridae	*Crotaphopeltis*	*hotamboeia*		L	H
	Lamprophiidae	*Lamprophis*	*capensis*			H

4. Invertebrates

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Little information is available on invertebrates of the region. Published accounts on the taxonomic groups targeted are restricted to butterflies and include a checklist of day butterflies of the Njesi Plateau, Inago, Namuli, Mulanje, Chiperone, Mabu and Zomba Mountains (Congdon et al. 2010). Additional published information on butterflies in this region includes observations from Mt. Mecula and Mt. Yao (Congdon et al. 2012) and Mt. Mabu (Bayliss et al. 2014). A new butterfly *Cymothoe baylissi* was recently described from Mt. Namuli, Mt. Mabu and Mt. Inago (Van Velzen et al. 2016).

Selected groups of invertebrates were collected through four main methods during our fieldwork.

Figure 4.1 Herpetologic pitfall trap (up left), Malaise trap (up right), light trap (below left) and entomologic pitfall trap (below right). (Pictures: Lore Geeraert)

1. Light trap

Target groups were hawkmoths (Lepidoptera: Sphingidae) and emperor moths (Lepidoptera: Saturnidae). Selected beetles (Coleoptera) were also collected.

The light trap setup (Figure 4.1) consisted of a 125W UV Mercury Vapour bulb (Philips, EPN) strung centrally above a white sheet draped over a rope. A black plastic (3 times 2 meters) covered the ground to easier collect inflying invertebrates. The light trap was powered by a small generator (900 Watt Tiger) and was activated soon after dusk on most days (Table 4.1).

Table 4.1 Light trap setup; latitudinal coordinates South (S) and East (E), elevation in meters (Elev.), date, start time and duration of light trapping and habitat.

Mountain	S	E	Elev. (m)	Date	Start time	Hours	Habitat
Chitagal	12°35'30.7"	35°18'22.8"	1030	6/11/16	7:40PM	2	Miombo
Chitagal	12°35'49.3"	35°15'35.7"	1428	7/11/16	6:20 PM	2	Grassland
Chitagal	12°35'49.3"	35°15'35.7"	1428	8/11/16	6:45PM	2.30	Grassland
Chitagal	12°35'49.3"	35°15'35.7"	1428	9/11/16	6:00PM	3	Riparian forest
Chitagal	12°35'49.3"	35°15'35.7"	1428	10/11/16	6:20PM	2.45	Riparian forest
Chitagal	12°35'49.3"	35°15'35.7"	1428	11/11/16	6:15PM	2.30	Riparian forest
Sanga	12°24'00.7"	35°20'07.0"	1702	14/11/16	8:00PM	1.30	Montane forest
Sanga	12°24'00.7"	35°20'07.0"	1702	15/11/16	7:30PM	1.40	Grassland
Sanga	12°24'00.7"	35°20'07.0"	1702	16/11/16	7:30PM	30	Montane forest
Njesi	12°49'56.8"	35°11'12.9"	1728	20/11/16	7:05PM	2.45	Grassland
Njesi	12°49'56.8"	35°11'12.9"	1728	21/11/16	6:35PM	2.40	Grassland
Njesi	12°49'56.8"	35°11'12.9"	1728	22/11/16	6:30PM	3	Grassland
Njesi	12°49'56.8"	35°11'12.9"	1728	23/11/16	6:15PM	4.15	Grassland

2. Pitfall trap

Target groups were spiders (Aranea) and ground beetles (Coleoptera: Carabidae). Most bycatch from pitfalls was collected. Two pitfall setups provided invertebrates; the invertebrate pitfalls, consisting of small (12 cm diameter) undeep (8 cm deep) transparent plastic cups filled with 50% ethanol (Figure 4.1) and the pitfall setup for herpetologic surveys consisting of six white cone shaped plastic containers (40 cm diameter) with a black plastic drift fence (Figure 4.1). The invertebrate pitfalls were placed with a distance of 10m from each other and the pitfalls for herpetological surveys were placed in a single line (Table 4.2).

Table 4.2. Entomological (Ent.) and herpetological (Herp.) pitfall trap setups, coordinates of the set-up location, elevation, habitat type distinguishing between montane forest (MF) and riparian forest (RF) (EV = edge vegetation), number of pitfalls (Traps), length of the driftfence in meters (Fence).

Mountain	S	E	Elev.	Date	Start time	Days	Habitat	Traps	Fence
Ent.	**pitfall traps**		**(m)**						**(m)**
Chitagal	12°35'49.1"	35°15'13.4"	1624	8/11/16	12:30 PM	3	MF	5	0
Sanga	12°22'58.0"	35°20'01.3"	1724	14/11/16	10:00 AM	4	MF	5	0
Sanga	12°22'52.8"	35°19'56.6"	1767	14/11/16	12:00 PM	4	MF	5	0
Njesi	12°49'45.9"	35°11'10.1"	1815	21/11/16	9:45 AM	3	MF	5	0
Njesi	12°49'43.1"	35°11'04.0"	1810	21/11/16	11:00 AM	3	EV	5	0
Herp.	**pitfall traps**								
Chitagal	12°35'49.3"	35°15'35.7"	1428	8/11/16	3:00 PM	3.5	RF	6	25
Sanga	12°24'00.7"	35°20'07.0"	1702	14/11/16	5:30 PM	4	MF	6	50
Njesi	12°49'53.3"	35°11'10.0"	1777	21/11/16	4:00 PM	3.5	RF	4 (6)	30 (40)

3. Malaise trap

Target groups were hoverflies (Diptera: Syrphidae), but all bycatch from malaise traps was collected. Two malaise traps were erected at each location and collected at the end of each stay. Collecting pots were filled with 50% ethanol (Figure 4.1). Malaise traps were placed in forest patches (Table 4.3).

Table 4.3 Malaise trap setups. Coordinates of the set-up locations, elevation in meters, habitat type distinguishing between montane forest (MF) and riparian forest (RF) (EV= edge vegetation).

Mountain	S	E	Elev. (m)	Date	Start time	Days	Habitat
Chitagal	12°35'49.1"	35°15'13.4"	1624	8/11/16	12:00 PM	3	MF
Chitagal	12°35'49.3"	35°15'35.7"	1428	9/11/16	9:00 AM	2.5	RF
Sanga	12°22'58.0"	35°20'01.3"	1724	14/11/16	9:45 AM	4	MF
Sanga	12°22'52.8"	35°19'56.6"	1767	14/11/16	11:30 AM	4	MF
Njesi	12°49'45.9"	35°11'10.1"	1815	21/11/16	9:30 AM	3	MF
Njesi	12°49'43.7"	35°11'05.4"	1812	21/11/16	10:30 AM	3	EV

4. *Handnets*

Target groups were butterflies (Lepidoptera) and dragonflies (Odonata).

Both opportunistic and targeted collecting aimed at including a wide range of habitats to collect a representation of butterflies and dragonflies active at the moment in the study region.

Results

Identifications for spiders (Aranea) and dragonflies (Odonata) are available. Identifications for the other invertebrates collected during this survey (Lepidoptera, Coleoptera, Diptera) are in progress.

Spiders (Aranea)

Spiders were identified by Dr. Rudy Jocqué from the Royal Museum of Central Africa (RMCA) in Tervuren, Belgium. A total of 37 species were collected. In this material at least seven species are new to science and at the time of writing, descriptions for the first species have started.

Table 4.4 List of adult spiders collected, listing the number of adult males (M), adult females (F) and the total specimens collected on the three mountain tops sampled; Chitagal (Ch.), Sanga (Sa) and Njesi Plateau (Nj).

	Family	Genus	Species	M	F	Total	Ch	Sa	Nj
1	Amaurobiidae	Gen.	sp.	3		3	3	0	0
2	Araneidae	*Neoscona?*	sp.	1		1	1	0	0
3	Clubionidae	*Clubiona*	sp.	1		1	0	1	0
4	Corinnidae	*Cambalida*	sp.	1	5	6	1	2	1; 2
5		*Copa*	*flavopilosa*		1	1	1	0	0
6		*Messapus*	n. sp.	1	0	1	0	1	0
7	Ctenidae	Gen.	sp. 1	56	11	67	8; 2	20; 6	28; 3
8		*Anahita*	sp. 3	1	0	1	1	0	0
9	Eutichuridae	*Cheiramiona*	n. sp.	3	3	6	0	1	2; 3
10	Gnaphosidae	Gen.	sp.	0	1	1	0	0	1
11	Linyphiidae	*Neriene*	*helsdingeni*	0	2	2	0	2	0
12		*Lepthyphantes* ?	sp.	0	2	2	0	0	2
13		Gen.	sp.	1	0	1	0	1	0
14	Liocranidae	*Hortipes*	n. sp.	2	0	2	0	0	2
15	Lycosidae	Gen.	sp. 1	8	20	28	4; 8	2; 4	2; 8
16		Gen.	sp. 2	0	2	2	0	2	0
17		Gen.	sp. 3	0	1	1	0	1	0
18		Gen.	sp. 4	6	12	18	2	7	4; 5
19	Migidae	*Poecilomigas*	n. sp.	2	0	2	0	0	2
20	Mimetidae	*Mimetus*	sp.	1	0	1	1	0	0
21	Pholcidae	Gen.	sp.	1	0	1	0	1	0
22	Phyxelididae	*Xevioso*	n. sp.	26	6	26	4	20; 4	2; 2
23	Salticidae	Gen.	sp. 1	1	0	1	0	0	1
24		Gen.	sp. 3	1	0	1	0	1	0
25	Scytodidae	Gen.	sp.	1	1	2	0	1	1
26	Sparassidae	Gen.	sp. 1	4	0	4	2	2	0

Table 4.4 cont. List of adult spiders collected, listing the number of adult males (M), adult females (F) and the total specimens collected on the three mountain tops sampled; Chitagal (Ch.), Sanga (Sa) and Njesi Plateau (Nj).

	Family	Genus	Species	M	F	Total	Ch	Sa	Nj
27		Gen.	sp. 2	0	1	1	0	1	0
28		Gen.	sp. 3	1	0	1	0	1	0
29	Tetragnathidae	*Pachygnatha*	n. sp.	6	30	36	0	5	6; 25
30	Theridiidae	*Steatoda*	sp. 1	2	1	3	0	0	2; 1
31		*Steatoda*	sp. 2	2	1	3	2; 1	0	0
32	Thomisidae	Gen.	sp.	3	0	3	0	0	3
33	Zodariidae	*Akyttara*	n. sp.	1	0	1	0	1	0
34		*Cicynethus*	n. sp.	3	0	3	0	1	2
35		*Diores*	n. sp.?	43	42	85	5	27; 27	16; 10
36		*Hermippus*	*loricatus*	3	0	3	3	0	0
37		*Mallinella*	n. sp.	14	2	16	14; 2	0	0

Dragonflies (Odonata)

Dragonflies were identified by Dr. Rosser Garrison from California Department of Food & Agriculture (Plant Pest Diagnostics Branch) in Sacramento, California, USA. A total of 12 species were collected. The small number of species collected is likely due to the opportunistic survey methodology and the time of collecting; at the very end of the dry season. Nevertheless the presence of several new country records (*Allocnemis maccleeryi* and *Gynacantha immaculifrons* male) are indicative of the little information available for this region.

Table 4.5 List of dragonfly species collected, listing the number of adult males (M) and adult females (F) on the three mountain tops sampled; Chitagal (Ch.), Sanga (Sa) and Njesi Plateau (Nj).

	Family	Genus	Species	author	date	Ch	Sa	Nj
1	Aeshnidae	*Gynacantha*	*immaculifrons*	Fraser	1956	1M		
2	Calopterygidae	*Umma*	*declivatum*	Förster	1906	1M; 4F		
3	Chlorocyphidae	*Platycypha*	*caligata*	Selys	1853	1M		
4	Coenagrionidae	*Pseudagrion*	*kersteni*	Gerstäcker	1869	1M		9M; 2F
5	Coenagrionidae	*Pseudagrion*	*sublacteum*	Karsch	1893	1M		
6	Libellulidae	*Atoconeura*	*biordinata*	Karsch	1899	2M		
7	Libellulidae	*Crocothemis*	*saxicolor*	Ris	1919			2M; 2F
8	Libellulidae	*Orthetrum*	*chrysostigma*	Burmeister	1839	1M		
9	Libellulidae	*Orthetrum*	*julia*	Kirby	1900	4M; 1F	2M	2M
10	Libellulidae	*Trithemis*	*furva*	Karsch	1899	1M		6M
11	Libellulidae	*Trithemis*	*pluvialis*	Förster	1906	2M		5M
12	Platycnemididae	*Allocnemis*	*maccleeryi*	Pinhey	1969	1M		

Remarks

Identification of the first groups of invertebrates from the expedition illustrate how little documented this region is. The relatively large number of new species for science in the studied terrestrial taxa (eg spiders) and several new country records for species with a higher dispersal capacity (eg dragonflies) indicate a clear need for further study. It remains unknown how widely distributed the undescribed species will be, and whether our field sites are an isolated area of endemism or whether this reflects the lack of study in the region.

Concluding remarks

Our surveys were only a brief insight into the biodiversity of the region of the Njesi Plateau, Mt Chitagal and Mt Sanga. Inherently the results of our surveys lack a temporal element owing to the limited time on the ground. However, despite this we were able to document the presence of numerous poorly studied and rare species across taxonomic groups.

Biogeography

The topic of the biogeographical significance of Mozambiques mountains as both an independent unit of conservation importance and from an evolutionary perspective compared to other eastern African highlands has gained traction following the upsurge of biological knowledge from the region (e.g. Bayliss et al. 2014; Bittencourt-Silva et al. 2016). While without more extensive analytical work it is not possible at this stage to place our findings into a more meaningful biogeographical context, it is intriguing to speculate some of the links in some of the taxanomic groups studied. In the avifauna, the presence of montane species presumably reaching their far southerly limits such as Usambara Nightjar, Dark Batis, Long-billed & African Tailorbirds, Olive-headed Greenbul and African Hill Babbler might indicate at least some affinity to mountains further north. However, numerous other Afromontane or highland species that are shared throughout eastern African mountains such as Dapplethroat and Yellow-streaked Greenbuls and species apparently restricted to southerly mountains such as Vincent's Bunting may indicate that the highlands of Niassa are a mixing zone of southerly and northerly taxa. Extent of habitat is however a key variable and Spottiswoode et al. (2016) found little affinitity of Mt Meculas (to the east of our study sites also in Niassa) birdlife to Afromontane species, but more of lower-elevation riparian forest species, concluding that its isolation has limited its linkages to other Mozambican mountains to the south, or Tanzanian mountains to the north. In reviewing the biogeography of montane butterflies of Mozambique however, Congdon et al. (2010) and Congdon & Bayliss (2013) indicated the highlands of Niassa to have strong affinities to Tanzania to the north and Malawi to the west and that other Mozambiquan mountains are more distinct. In the herpetofauna, Portik et al. (2014) indicate that biogeographical linkages of highland species are complex and often lacking comparative survey data but have clear links to both mountains to the west and north. One intriguing discovery during our expedition, that of *Cordylus meculae* on both Mts Sanga and Chitagal, a species only previously known from its type locality on Mt Mecula (Branch *et al* 2005 a,b) indicates a possible link between Niassas mountains. Taken together, our understanding of the biogeography of Mozambiques mountains is still in its infancy with large bodies of comprehensive survey data unavailable within and between taxanomic groups. However, with the addition of new data presented here it is our hope that this information can be used to gradually clarify these patterns.

Conservation

We documented numerous range-restricted and threatened species across groups, also finding a number of significant extensions to species geographic ranges. While the extent of human disturbance can be difficult to quantify, there appeared to be different extents of visible disturbance between sites. On the Njesi Plateau there was a high density of snaring, whereas very little or no snaring was observed on Mt Chitagal and Mt Sanga. Whether land-use activities have degraded historic habitats is not clear, although Congdon et al. (2010) indicated that the Njesi Plateau may have once have had greater forest cover. Further, Congdon et al. (2010) also refer to evidence of extensive industrial-scale Potato farming during colonial times in the gulley splitting the two main highlands of the plateau (see Figure 12).

Whether burning is entirely natural, anthropogenic or a mixture at the sites remains unclear. The remote nature, particularly of Mt Chitagal (as also noted by Ryan & Spottiswoode 2003) probably affords it much protection from some human disturbance. Mt Sanga is more accessible, but visible human impacts, except possible burning were lower (despite much of the surrounding Miombo woodland to the east of the mountain being highly degraded). Whether the lack of larger mammals encountered at these sites was a product of direct local hunting, seasonal differences due to lack of rain, or a by product of high poaching density in the general region is unknown. We also observed no evidence of deforestation in the higher elevation habitats at least on these two mountains at the time of writing. Furthermore, there appear to be extensive areas of lower elevation Miombo woodland to the west of the plateau in general, although fires were clearly pervasive and could be seen during the night from the summit of Mt Sanga .

We documented the presence of numerous important species of birds of conservation concern at the study sites, likely warranting a northerly extension of the current Important Bird Area (Parker 2001; BirdLife International 2017) for the region. Further, this designation requires updating based on new information presented here and incorrect information presented in the current designation (see Biodiversity Surveys 1.- Avifauna). The lack of many large mammals noted as apparently present (albeit only at Mt Chitagal) by Ryan & Spottiswoode (2003) is more worrying, however. Their absence may reflect ongoing declines via large-scale poaching of much of the large-mammal fauna of the region. More genetic work is required to fully understand the herpetofaunal diversity of the region, but the discovery of a new locality of the afore-mentioned *Cordylus meculae* is of particular importance given the disturbed nature of Mt Mecula, its type locality (Branch et al. 2005). Regrettably, we are not yet able to present data from the floral element of our survey as much of the collected material requires identification clarification.

Results from this short field survey evidence the importance of both the further exploration of Mozambiques highlands and the lack of information from formal survey efforts in Mozambican highlands in general. As is to be expected, for most species groups further survey effort, particularly at different times of year would certainly yield more important discoveries.

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