

The discovery, biodiversity and conservation of Mabu forest—the largest medium altitude rainforest in southern Africa

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Abstract The montane inselbergs of northern Mozambique have been comparatively little-studied, yet recent surveys have shown they have a rich biodiversity with numerous endemic species. Here we present the main findings from a series of scientific expeditions to one of these inselbergs,

Mt Mabu, and discuss the conservation implications. Comprehensive species lists of plants, birds, mammals and butterflies are presented. The most significant result was the discovery of a c. 7,880 ha block of undisturbed rainforest, most of it at medium altitude (900–1,400 m), a forest type that is not well represented elsewhere. It is possibly the largest continuous block of this forest type in southern Africa. To date, 10 new species (plants, mammals, reptiles and butterflies) have been confirmed from Mt Mabu, even though sampling effort for most taxonomic groups has been low. The species assemblages indicate a relatively long period of isolation and many species found are at the southern limit of their range. Conservationists are now faced with the challenge of how best to protect Mt Mabu and similar mountains in northern Mozambique, and various ways that this could be done are discussed.

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Introduction

Across large parts of northern Mozambique (the region north of the Zambezi River) the landscape is dominated by scattered granitic inselbergs, many of which rise above 1,500 m and support moist evergreen forest or rainforest on their slopes. These inselbergs form a poorly-known archipelago of isolated rock and forest islands, usually surrounded by woodland. However, with the exception of the Namuli massif (Timberlake et al., 2009), these massifs and mountains have attracted comparatively little biological attention (Branch, 2011).

In contrast, similar mountains in southern Malawi, many < 200 km away, have been better studied, particularly the large massif of Mt Mulanje, which covers an area of c. 650 km² and rises to > 3,000 m, the second highest mountain range in southern Africa (Chapman, 1995;

Strugnell, 2002; Bayliss et al., 2007). Conservation of the forests and biodiversity on Mt Mulanje was bolstered by the creation of a trust fund under the Mulanje Mountain Conservation Trust, an NGO that has now gained significant experience in the implementation of conservation action and in public engagement (Wisborg & Jumbe, 2010).

Given the experience and knowledge of Mulanje Mountain Conservation Trust and others on Mt Mulanje, and the lack of such knowledge and conservation action on similar massifs in adjacent parts of northern Mozambique, a project was developed to explore the Mozambique mountains (Fig. 1) and to enhance their conservation by linking experience and knowledge in Malawi and Mozambique. This project, Monitoring and Managing Biodiversity Loss in South-east Africa's Montane Ecosystems, was a collaborative venture between the Royal Botanic Gardens, Kew and BirdLife International in the UK, the Instituto de Investigação Agrária de Moçambique and the Natural History Museum in Mozambique, and Mulanje Mountain Conservation Trust and the Forest Research Institute in Malawi. It was funded under the UK Government's Darwin Initiative from 2006 to 2009 (Smith & Bayliss, 2009). Here we outline the main findings on Mt Mabu, especially for the forest areas, and provide species lists of plants, birds, mammals, reptiles, amphibians and butterflies. We also outline the main threats to this ecosystem and discuss how the conservation of Mabu and similar mountains in northern Mozambique, which form what is effectively an archipelago of islands, could be achieved.

Discovery of Mt Mabu

During the establishment phase of the Darwin project, satellite imagery from Google Earth (2013) was used in the selection of massifs or inselbergs in northern Mozambique that are higher than 1,500 m but relatively close to Mt Mulanje. The sites selected were Mts Chiperone, Namuli, Cucutea, Inago and Mabu in Mozambique, and Mchese Mountain adjacent to Mulanje in southern Malawi (Fig. 1). As Mt Mabu was identified (by JB) using Google Earth, it has sometimes been referred to as the Google Forest. It has more recently been called the Butterfly Forest because of the butterfly hill-topping phenomena that occurs on the summit at certain times of the year (Bright, 2012).

Once selected, reconnaissance visits were organized to each site to assess ecological status and accessibility. The first visit to Mt Mabu was in December 2005 by JB, CS, E. Hermann and HP. The approach began from the abandoned Cha Madal Tea Estate on the south-eastern slopes. During this reconnaissance an expanse of rainforest was seen beyond the peak extending to the horizon. Several days were spent exploring and recording forest biodiversity, especially birds, butterflies and plants (Spottiswoode et al.,

2008), and the forest was noted to be in excellent condition. Satellite imagery of the area was later used to determine forest extent in greater detail, suggesting that it may be the largest continuous tract of mid-altitude (900–1,400 m) rainforest (White, 1983) remaining in southern Africa.

Findings

Forest extent

As a result of the initial visits to Mabu, an unsupervised classification of forest extent was produced using a Landsat 7 ETM+ image (reference S-37-15-2000, 30 m resolution) from 2000, viewed through very near infra-red filters (Spottiswoode et al., 2008). This suggested a possible total forest extent of 5,000–7,000 ha, excluding the adjacent abandoned tea plantations. In October 2008 a more accurate draft land-cover map was created based on an unsupervised classification (maximum likelihood algorithm applied to a 6-band stack image) of a Landsat ETM+ image with 30 m resolution from July 2005. In the field this map was checked for accuracy of the classified vegetation types and a final vegetation map developed using the same Landsat image with radiometric and geometric correction. The following broad land-cover types were identified: moist forest, woodland, agricultural land, rock and bare ground. Based on this initial interpretation it was calculated that there are 6,937.4 ha of moist forest in planimetric view, largely above 1,000 m (Fig. 2), although this figure is an underestimate as much of the forest is on steep slopes. Assuming that the forest between 1,000 and 1,400 m is on a 30° slope, and areas below 1,000 m and above 1,400 m are on a 15° slope, slope correction factors (simple tangent values) were applied (Timberlake et al., 2012), giving a total estimated forest extent of 7,880 ha (Table 1).

Forest carbon storage

There is significant forest carbon stored in the forests on Mt Mabu. Carbon conversion values for particular forest types were used following those developed by Willcock et al. (2012) for the Eastern Arc Mountains in Tanzania. These values are more accurate than those available through the IPPC Tier 1 look-up values (GOF-C-GOLD, 2008) for forest type and have 95% confidence intervals. The total above-ground live carbon value of the moist forest area is estimated to be 2,053,767 Mg (2.05 Tg). The total carbon storage value including above-ground live vegetation, litter layer, coarse woody debris, below-ground live matter, and soil carbon is estimated to be c. 3,634,539 Mg (3.6 Tg) for the rainforest area only. Following the carbon storage values presented in Willcock et al. (2012), if the total forest area was converted to bushland with scattered crops (117.8 Mg ha⁻¹) a value of 0.9 Tg of carbon would be lost, a loss of 2.7 Tg

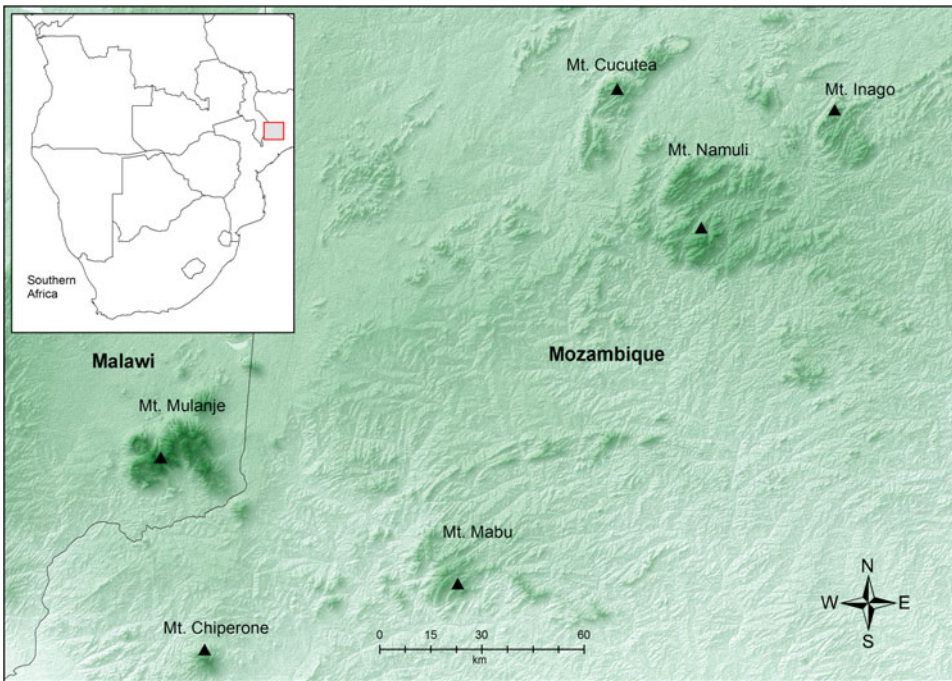


Figure 1 The inselbergs that rise above 1,500m in southern Malawi and north-east Mozambique.

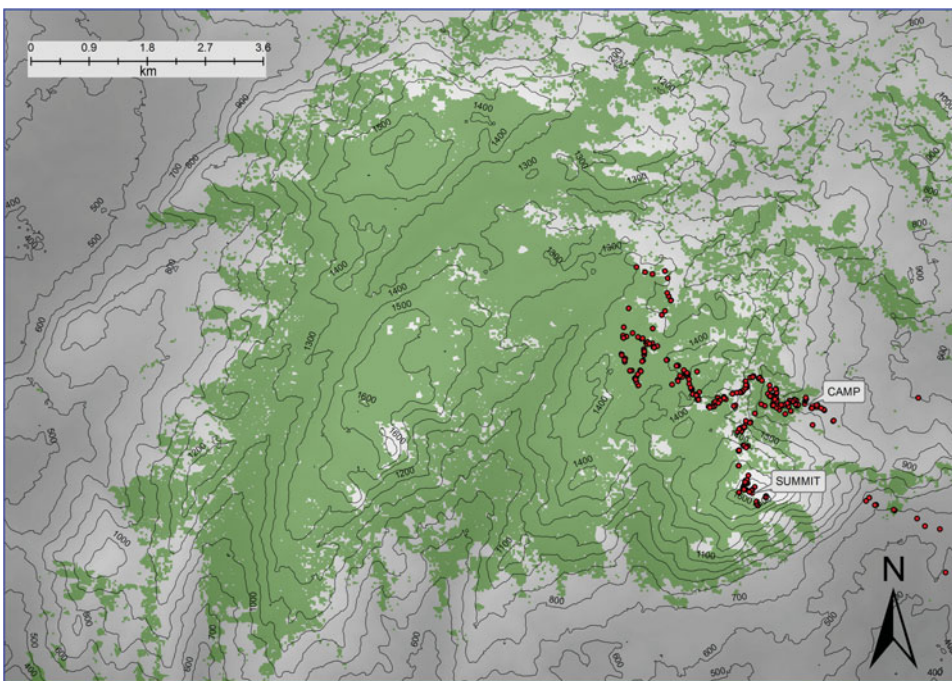


Figure 2 An overview of the forest extent (green) and the topography of the surrounding land. The red points (obtained with a global positioning system) indicate the extent of the forest explored.

of carbon into the atmosphere. Likewise if the area was converted to woodland with scattered crops (183.3 Mg ha^{-1}) the value would be 1.4 Tg, a loss of 2.2 Tg of carbon.

Biodiversity

To date c. 20% of the forest has been at least partially surveyed biologically (Fig. 2), and it is envisaged that a

significantly greater number of species will be found with further investigation. The majority of the biological study centred on the vicinity of the original survey camp (Fig. 2), an area that incorporates the main Mt Mabu summit and the immediate surrounding forest. A description of the main vegetation types and the various animal species found is given below. Checklists are provided in Supplementary Tables S1–S5 and Timberlake et al. (2012).

Table 1 The area of forest cover (ha) by altitudinal class, with percentage of total forest cover, area corrected for slope (see text for details), associated above ground live carbon storage, and total carbon storage (above ground live carbon, litter, coarse woody debris, below ground live carbon and soil carbon; Willcock et al., 2012).

Altitude (m)	Planimetric forest area (ha)	%	Forest area with slope correction	Above ground live carbon storage (Mg ha ⁻¹)	Total forest carbon storage (Mg ha ⁻¹)
<1,000 m (lowland forest)	1,454.28	21.0	1,600	1,600 × 206.7 = 330,720	1,600 × 386.5 = 618,400
1,000–1,400 m (sub-montane forest)	5,210.5	65.8	5,270	5,270 × 283.2 = 1,492,464	5,270 × 490.2 = 2,583,354
>1,400 m (montane forest)	919.50	13.2	1,010	1,010 × 228.3 = 230,583	1,010 × 428.5 = 432,785
<i>Total forest cover (ha)</i>	7,584.28	100	7,880	2,053,767	3,634,539

Vegetation and Plants (Supplementary Table S1)

Above 1,000 m altitude the majority of Mt Mabu is covered in rainforest; below this is woodland characterized by *Pterocarpus angolensis* and *Syzygium cordatum*, with overgrown tea *Camellia sinensis* plantations on the south-eastern side (Timberlake et al., 2012). On the drier western and northern slopes, which were not visited, forest only appears to start at 1,400 m, extending down to 1,200 m along drainage lines and in gullies. The rainforest is of two broad types (Dowsett-Lemaire & Dowsett, 2009): medium-altitude rainforest at 950–1,400 m (c. 5,270 ha) and moister Afromontane rainforest at 1,350–1,400 m up to 1,650 m (c. 1,010 ha). Medium-altitude forest is characterized by 40–50 m tall trees of *Strombosia scheffleri*, *Newtonia buchananii*, *Chrysophyllum gorungosanum* and *Maranthes goetzeniana*, with occasional scattered figs (*Ficus* spp.). Sub-canopy trees include *Drypetes gerrardii*, *Funtumia africana*, *Garcinia kingaensis*, *Diospyros abyssinica* and *Rawsonia lucida* and a number of Rubiaceae such as *Heinseniania diervilleoides* and *Tricalysia pallens*. The main canopy liana is *Millettia lasiantha*. Large clumps of the bamboo *Oreobambos buchwaldii* are found on drier slopes and in gullies. In Afromontane forest the canopy is lower at 20–25 m, down to 10–15 m at its upper limit. Typical tree species at lower altitudes include *Olea capensis* and *Podocarpus latifolius*, with *Tabernaemontana stapfiana*, *Garcinia kingaensis*, *Myrianthus holstii* and *Synsepalum muelleri* in the sub-canopy, and *Rapanea melanophloeos*, *Aphloia theiformis*, *Faurea racemosa*, *Macaranga capensis*, *Prunus africana* and *Syzygium guineense afromontanum* become more common at higher altitudes.

Above the forest, at 1,600–1,700 m, rounded granite peaks support scattered patches of montane shrubland surrounded by clumps of the sedge *Coleochloa setifera* and the grass *Danthoniopsis* sp. This shrubland comprises stunted trees of *Rapanea melanophloeos* along with *Syzygium cordatum*, *Aphloia theiformis*, *Maytenus acuminata* and the shrubs *Aeollanthus buchnerianus* and *Tetradenia riparia*. In more exposed areas the dominant low shrub is *Aeschynomene nodulosa* along with *Kotschyia recurvifolia*.

Some plant species of particular conservation interest were found, and two new species (the mistletoe *Helixanthera schizocalyx* and a shrub *Vepris* sp. nov.). However, some species previously thought to be endemic to other mountains, such as the orchid *Polystachya songaniensis*, previously known only from Mts Mulanje and Zomba in Malawi, and the bulbous herb *Dianella ensifolia* previously known only from the Chimanimani Mountains, were also found.

Birds (Supplementary Table S2)

A total of 126 bird species, including 18 Afromontane endemic or near-endemic species, have been recorded from Mabu (Spottiswoode et al., 2008; Dowsett-Lemaire, 2010). Some of these occur only above 1,350–1,400 m; e.g. Rameron pigeon *Columba arquatrix*, bar-tailed trogon *Apaloderma vittatum*, starred robin *Pogonocichla stellata*, Swynnerton's robin *Swynnertonia swynnertonii*, Namuli apalis *Apalis (thoracica) lynesi*, dapple-throat *Modulatrix orostruthus* and Cape batis *Batis capensis dimorpha*. The list includes seven species on the IUCN Red List (IUCN, 2013): southern banded snake eagle *Circaetus fasciolatus* (Near Threatened) occurs in small numbers and mainly below 1,000 m; spotted ground thrush *Zoothera guttata* (Endangered, Mabu and Namuli being the only likely breeding locations in Mozambique) is apparently rare; Cholo alethe *Alethe choloensis* (Endangered) is common, especially above 1,200 m, and Mulanje is one of the two most important areas for the conservation of the species; Gunning's akalat *Sheppardia gunningi* (Near Threatened), with an important population at 400–1,350 m, although it occurs in the tea forest; Swynnerton's robin (Vulnerable) occurs commonly above 1,350 m, and this population partly bridges the gap in its recorded distribution between those of eastern Zimbabwe/southern Mozambique and central Tanzania; Namuli apalis (Near Threatened) hitherto thought to be endemic to Namuli (where it is common) is rare and found only above 1,400 m but this discovery suggests the species may also be present on adjacent mountains; dapple-throat (Vulnerable), for which Mabu represents a small range

extension to the south-west (from Namuli), is rare and found only above 1,400 m. Thus Mabu's extensive forest cover is an important refuge for several rare and threatened bird species in this part of Africa.

Mammals (Supplementary Table S3)

Small mammals were opportunistically surveyed over several visits; 19 species were collected over 1,000–1,300 m comprising four species of rodents, three shrews and 12 species of bat. The four rodent species are tropical forest specialists and, except for *Grammomys dolichurus*, represent their southernmost known populations. The main rodent collected was the soft-furred mouse *Praomys delectorum*. Although the lesser pouched rat *Beamys major* has been included in the widespread *Beamys hindoi*, and *Lophuromys aquilus* in the widespread *Lophuromys flavopunctatus*, leading to IUCN Red List categories of Least Concern, it is likely that these southern populations will prove to be distinct (Musser & Carleton, 2005). Shrew species on Mt Mabu (*Crocidura luna* and *Crocidura olivieri*) are also associated with tropical forest and woodlands.

The bat assemblage is similar to that found on nearby mountains such as Mt Mulanje and is dominated by species of Rhinolophidae and Hipposideridae. A single specimen of an unidentified *Kerivoula* was collected; it seems to be distinct from the two recognized Southern African species, *K. argentata* and *K. lanosa*. One new species of horseshoe bat, *Rhinolophus mabuensis* (Taylor et al., 2012), was collected and was also found on neighbouring Mt Inago (Bayliss et al., 2010; Monadjem et al., 2010a).

Information on larger mammals was also recorded opportunistically and with the knowledge of a local hunter (Dowsett-Lemaire & Dowsett, 2009). The blue monkey *Cercopithecus albogularis* is common within the forest and is hunted by the local community using bow and arrows, and Grant's bush baby *Galagoides (zanzibaricus) granti* was heard calling at night. Forest antelopes such as blue duiker *Cephalophus monticola*, bushbuck *Tragelaphus scriptus* and klipspringer *Oreotragus oreotragus* are hunted for bushmeat, primarily using gin-traps, along with the two hyrax species *Procavia capensis* and *Heterohyrax brucei*. According to local hunters leopard *Panthera pardus* are occasionally encountered. Buffalo *Syncerus caffer* and elephant *Loxodonta africana* were historically common in the forest although they have not been seen in recent years.

Reptiles and Amphibians (Supplementary Table S4)

Collections of herpetofauna recorded seven amphibian and 15 reptile species (nine lizards and six snakes), although most collecting has not been at optimum times.

Three new reptiles have been discovered including a forest viper *Atheris mabuensis* (Branch & Bayliss, 2009), the southernmost record of the genus; a chameleon, *Nadzikambia baylissi*, belonging to a genus previously thought to be endemic to Mt Mulanje (Branch & Tolley, 2010; Branch, 2011), and a new species of pygmy chameleon (*Rhampholeon* sp. nov) that awaits description (W.R. Branch et al., unpubl. data). Probable new species include an unusual large-scaled bush snake (*Philothamnus* cf. *carinatus*), and a tree snake (*Dipsadoboa* sp.). The taxonomic status of other species is also currently under investigation, including the status of a rare burrowing skink (*Melanoseps* sp.) and two cryptic leaf-litter frogs (*Arthroleptis* sp.). Many of the species recorded are at the southernmost limits of their ranges and have affinities to groups from the north and west.

Butterflies (Supplementary Table S5)

Butterflies on Mt Mabu have been studied in eight visits, and in various seasons (Congdon & Bampton, 2009; Congdon et al., 2010; Timberlake et al., 2012), with a total of 203 taxa recorded. The expected total is likely to be c. 250 species, similar to the butterfly fauna of neighbouring mountains such as Mt Mulanje. The phenomenon known as hilltop-ping (Shields, 1967) was observed on Mt Mabu; hundreds of butterflies of many families gather en masse throughout October and November during 10.30–11.30 on the summit (Bright, 2012).

Four of these are new species (*Baliochila* sp. nov; *Cymothoe* sp. nov, R. Van Velsen et al., unpubl. data; *Epamera* sp. nov., J. Bayliss et al., unpubl. data; *Leptomyrina* (*Gonatomyrina*) sp. nov.), and there are three new subspecies (*Papilio pelodurus* ssp. nov; *Baliochila woodi* spp. nov; *Neocoenyrus biculata* ssp. nov), and 35 new records for Mozambique (Congdon et al., 2010). Several of the new species have also been caught on neighbouring mountains, such as the new *Cymothoe* (Mt Namuli, Mt Inago), the *Epamera* (first caught on Mt Namuli) and *Leptomyrina* (Mt Namuli, Mt Inago).

Biogeographical considerations

The high number of endemic species discovered on Mt Mabu and surrounding mountains suggests a long period of isolation and ancient linkages with the north. Within most taxonomic groups there is evidence of a significant influence from mountains to the north (Tanzania) and to the west (Malawi), such as the Eastern Arc Mountains and Moreau's Tanganyika–Nyasa Montane Chain, with the greater influence from the latter. This is particularly evident in the butterfly fauna (Congdon et al., 2010; R. Van Velsen et al., unpubl. data). Many species and

genera collected are at the southernmost limits of their range, such as the long-tailed pouched rat, the new bush viper, the new pygmy chameleon (*Rhampholeon* sp. nov.), burrowing skink (*Melanoseps* sp.), and the new montane *Cymothoe* butterfly.

The terrestrial small mammal fauna of these isolated relic montane forests of northern Mozambique forms an important southern refuge biogeographically, linked with the montane forests of central Malawi and eastern Africa (Kenya, Uganda, Tanzania, Democratic Republic of Congo), and that are not listed in the southern African subregion as defined by Skinner & Chimimba (2005); i.e. occurring south of the Zambezi River.

Within the herpetofauna a number of species are shared with adjacent Mt Mulanje. Closely-related chameleons occur on both mountains, with *Nadzikambia mlanjensis* and *Rhampholeon platyceps* on Mt Mulanje and the sister taxa *N. baylissi* and *Rhampholeon* sp. nov on Mt Mabu (Branch & Tolley, 2010). No forest viper (*Atheris* sp.) has been recorded from Mt Mulanje but *A. mabuensis* is now known from both Mt Mabu and Mt Namuli (Branch & Bayliss, 2009).

Afromontane birds found on Mabu currently total 18 species, which is relatively low in comparison with neighbouring mountains (Mt Mulanje has 31). This is probably because of the limited extent of montane grassland and shrubland on Mabu, hence species such as the blue swallow *Hirundo atrocaerulea* cannot occur, and the areas covered by Afromontane forest (as opposed to mid altitude forest) are relatively small.

Rainforests generally contain few endemic plants in this part of Africa, most species being very local in occurrence but distributed in forests over a large part of the region. Some records show that Mabu's montane flora has similarities to that on Mt Mulanje (the orchid *P. songaniensis*), but some are of species previously only recorded from the Chimanimani and other mountains along the Mozambique/Zimbabwe border (the herbs *Cryptostephanus vansonii* and *D. ensifolia*), whereas others show links to mountains in southern Tanzania and northern Malawi (the herbs *Crotonogynopsis usambarica*, *Mimulopsis arborescens* and the parasite *Viscum cylindricum*).

As the number of endemic species discovered in northern Mozambique increases, so does the case for the recognition of a new montane ecoregion. The evidence outlined here suggests that this region is biogeographically distinct from the species assemblages on neighbouring mountain ranges such as the Eastern Arc Mountains in southern Tanzania (Burgess et al., 2006, 2007).

Discussion

The greatest threat to forest biodiversity on Mt Mabu is from encroachment of slash and burn agriculture around the

edges of the forest block, especially from the north-east to south-east, and from bushmeat hunting using gin-traps. The present level of hunting is thought to be so high that populations of some species such as the crested guinea fowl *Guttera pucherani* (Dowsett-Lemaire, 2010) could become locally extinct.

Although there are few trees of commercial interest, logging activities are increasing in the surrounding woodlands and neighbouring mountains, and the future of the surrounding Cha Madal tea estate will play a crucial role in the conservation of the forest as this will determine land use and employment opportunities in the immediate vicinity. The tea plantations are currently not commercially viable because of the type of tea grown (China hybrid) but there could be a future in the extraction of Camellia oil from the tea tree seeds. Because of its close proximity a link with the tea industry in Malawi could prove commercially viable.

Hitherto, because little was known about Mt Mabu and its forest beyond the local area, it was free from outside exploitation, despite Mozambique's booming economy. The recent scientific expeditions to Mt Mabu have given rise to extensive media coverage, and also to a desire (within Mozambique and in the wider community) to conserve such an important habitat. The diversity of endemic species raises the profile of the area, and more discoveries of new species are expected.

Conservation recommendations

A number of factors currently favour the conservation of the area: the local paramount chiefs, the provincial government, and the national government are all in favour of protection and conservation; the surrounding human population is currently low; the forest is in good condition; the discovery of new species has raised the conservation justification for its protection; and access to the area is poor, which has so far favoured its protection.

To address current and future threats there is a need for a strategic conservation management plan, supported by government and local communities. In 2009 the Government of Mozambique agreed to protect the forest but as yet it has not been gazetted as a protected area. However an initiative towards registering Mabu forest as an area for conservation and nature-based tourism use only, by the NGO Justiça Ambiental, has started. The model for the conservation of Mt Mabu has not yet been determined but potential models include those of the Mulanje Mountain Conservation Trust in Malawi (Wisborg and Jumbe, 2010), the Amani Nature Reserve (2013) and Udzungwa Mountains National Park (2013), both in the Eastern Arc Mountains of Tanzania, and Gorongosa National Park in Mozambique (2013).

The communities around Mt Mabu have a vested interest in the ecosystem services that originate in the forest. Justiça

Ambiental and Fauna and Flora International, supported by the Critical Ecosystem Partnership Fund (CEPF, 2013), are working closely together to establish a community-based organization to manage potential nature-based tourism activities. Although there are few large charismatic animals to attract this sort of tourism, Mt Mabu is particularly important for rare birds, and it supports a variety of endemic and restricted range species. Specialist bird or rainforest tours could have a limited potential for income generation, although probably insufficient to fund a conservation programme. Amani Nature Reserve and Udzungwa National Park already cater for specialist bird watching in northern Tanzania.

The development of low-impact tourism, managed in part by local communities, may be the most appropriate land use for the massif. This would require a programme for training and licensing local guides (educating the guides in local history, knowledge of the forest and its plants and animals, and an ability to communicate this for ecotourism) and a base accessible by road, ideally on the old Cha Madal tea estate on the south-east slopes of the mountain from which access to the mountain is easily gained.

Another reason for the protection of the forest on Mt Mabu is mitigation of climate change at a local level. Mabu's wet forest currently locks up a considerable quantity of carbon (3.6 Tg in total) that would be released if the forest is destroyed (Table 1). The forest area could also be entered under a carbon accreditation scheme. Bottled mineral water could be a commercially viable venture for Mabu (water from the largest rainforest in southern Africa).

Research

Despite a limited amount of field research, many new species have recently been discovered on Mt Mabu (Bayliss, 2008; Branch & Bayliss, 2009; Timberlake et al., 2009, 2012; Branch & Tolley, 2010; Congdon et al., 2010; Monadjem et al., 2010a; Harris et al., 2011; Taylor et al., 2012; J. Bayliss et al., unpubl. data ; W.R. Branch et al., unpubl. data ; R. Van Velsen et al., unpubl. data) and neighbouring inselbergs (Bayliss et al., 2010; Fishpool & Bayliss, 2010; Staude et al., 2011; Savel & Bayliss, 2012). The forest is particularly important for rare bird species. Further research should focus on taxonomic groups that have not been surveyed in sufficient detail, such as primates, small mammals, herpetofauna and invertebrates. A more detailed plant survey would increase the number of new plant records, particularly once the northern and western sides of the mountain are explored. In addition, the factors determining forest extent require investigation.

More broadly, a comparative study is needed of the high altitude inselbergs (>1,500 m) across northern Mozambique and southern Malawi, and those further afield in southern Tanzania and eastern Zimbabwe, focusing

on the distribution ranges of endemic species. These mountain ranges are of similar age and our findings suggest that they share similar biological assemblages. On this basis it may be appropriate to consider the recognition of a new montane ecoregion based on the south-central African montane inselbergs, possibly following a similar delimitation approach used for the Eastern Arc Mountains (Platts et al., 2011).

The reason Mt Mabu remained unfamiliar to the outside world, and largely undisturbed, lay in its remoteness and inaccessibility. Now that Mozambique is receiving increasing foreign investment and subsequent development, Mabu's forest is under potential threat from commercial logging and clearance for local agriculture. Measures need to be taken to protect it from these and similar threats such as unsustainable levels of hunting and wildfires.

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Biographical sketches

The authors comprise of a multidisciplinary team of conservation scientists, taxonomists, foresters, and development managers, members of civil societies and museums, and PhD students. Collectively the team has many years of experience working in Africa, and in particular Mozambique.

SUPPLEMENTARY TABLE S1 Plant checklist for Mt Mabu above 800 m. The botany of Mabu was opportunistically investigated by H. Patel on several visits in December 2005 and January 2006 (Spottiswoode et al., 2008), and systematically surveyed in October 2008 (Dowsett-Lemaire & Dowsett, 2009; Timberlake et al., 2012). Plant identifications follow African Plants Database (2012) and were confirmed by J. Timberlake, T. Harris and F. Dowsett-Lemaire.

Family (by group)	Species	Life-form ¹	Habit ²	Records ³
Pteridophytes				
Aspleniaceae	<i>Asplenium dregeanum</i> Kunze	Herb	Medium-altitude forest	Specimen
	<i>Asplenium erectum</i> (Willd.)	Herb	Moist Forest	Specimen
	<i>Asplenium holstii</i> (Hieron)	Herb	Forest	Specimen
Cyatheaceae	<i>Cyathea dregei</i> Kunze	Shrub	Forest	Specimen
Dennstaedtiaceae	<i>Blotiella natalensis</i> (Hook.) Tryon	Herb	Forest	Specimen
Lomariopsidaceae	<i>Lomariopsis warneckeii</i> (Hieron.) Alston	Climber/liana	Forest	Specimen
Marattiaceae	<i>Marattia fraxinea</i> Sm. var. <i>salicifolia</i> (Schrad.) C.Chr.	Herb	Forest	Specimen
Polypodiaceae	<i>Pleopeltis macrocarpa</i> (Willd.) Kaulf.	Herb	Forest	Specimen
Pteridiaceae	<i>Pteridium aquilinum</i> (L.) Kuhn ssp. <i>aquilinum</i>	Herb	Transition woodland	2 Specimens
Gymnosperms				
Podocarpaceae	<i>Podocarpus latifolius</i> (Thunb.) Mirb.	Tree	Moist forest	Specimen
Monocotyledons				
Aloaceae	<i>Aloe arborescens</i> (Mill.)	Shrub	Granitic dome	Specimen
	<i>Aloe sp.</i>	Herb	Granitic dome	2 Specimens
Amaryllidaceae	<i>Cryptostephanus vansonii</i> (I. Verd.)	Herb	Forest	Specimen
Araceae	<i>Culcasia falcifolia</i> (Engl.)	Climber/liana	Forest	2 Specimens
Arecaceae	<i>Phoenix reclinata</i> (Jacq.)	Tree	Forest, Woodland	2 Specimen
Asparagaceae	<i>Asparagus setaceus</i> (Kunth) Jessop	Climber/liana	Forest	Specimen
Behniaceae	<i>Behnia reticulata</i> (Thunb.) Didr.	Climber/liana	Moist forest	Specimen
Commelinaceae	<i>Aneilema aequinoctiale</i> (P.Beauv.) Loudon	Herb	Forest	Specimen
	<i>Commelina diffusa</i> (Burm.f.)	Herb	Forest	Specimen
	<i>Pollia condensata</i> (C.B. Clarke)	Herb	Forest	Specimen
Cyperaceae	<i>Coleochloa setifera</i> (Ridl.) Gilly	Grass/sedge	Granitic dome	Specimen
	<i>Cyperus fischerianus</i> (Schimp.)	Grass/sedge	Granitic dome	Specimen
	<i>Cyperus cf. albostriatus</i> (Schrad.)	Grass/sedge	Granitic dome	Specimen
Dracaenaceae	<i>Dracaena fragrans</i> (Ker Gawl.)	Herb	Forest	Specimen
	<i>Dracaena laxissima</i> (Engl.)	Climber/liana	Forest	Specimen
Hyacinthaceae	<i>Drimia calcarata</i> (Baker) Stedje	Herb	Granitic dome	Specimen
Hypoxidaceae	<i>Hypoxis angustifolia</i> (Lam.)	Herb	Granitic dome	Specimen
Orchidaceae	<i>Angraecopsis parviflora</i> (Thours) Schltr.	Epiphyte	Moist forest	Specimen
	<i>Bulbophyllum ballii</i> (P.J. Cribb)	Epiphyte	Moist forest	Specimen
	<i>Bulbophyllum sandersonii</i> (Hook.f.) Rchb.f.	Epiphyte	Forest	Specimen
	<i>Liparis caespitosa</i> (Lam.) Lind.	Epiphyte	Forest	Specimen

	<i>Polystachya fusiformis</i> (Thouars) Lindl.	Epiphyte		Specimen
	<i>Polystachya malilaensis</i> (Schltr.)	Epiphyte	Transition woodland	Specimen
	<i>Polystachya songaniensis</i> (G.Will.)	Epiphyte	Granitic dome	Specimen
	<i>Polystachya transvaalensis</i> (Schltr.)	Epiphyte	Moist forest	Specimen
Poaceae	<i>Danthoniopsis</i> sp. (possibly)	Grass/sedge	Granitic dome	2 Specimens
	<i>Helictotrichon elongatum</i> (A.Rich.) C.E.Hubb.	Grass/sedge	Granitic dome	Specimen
	<i>Leptaspis cochleata</i> (Thw.)	Grass/sedge	Forest	Specimen
	<i>Oreobambos buchwaldii</i> (K.Schum.)	Shrub	Forest	2 Specimens
	<i>Oxytenanthera abyssinica</i> (A.Rich.) Munro	Shrub	Transition woodland	2 Specimens
	<i>Panicum brevifolium</i> (L.)	Grass/sedge	Forest	Specimen
Smilacaceae	<i>Smilax anceps</i> (Willd.)	Climber/liana	Forest	2 Specimens
Xanthorrhoeaceae	<i>Dianella ensifolia</i> (L.) DC.	Herb	Transition woodland	Specimen
Zingiberaceae	<i>Aframomum albiflorum</i> (Lock)	Herb	Transition woodland	Specimen
	<i>Aframomum angustifolium</i> (Sonn.) K.Schum.	Herb		Specimen
Dicotyledons				
Acanthaceae	<i>Acanthus ueleensis</i> (De Wild.)	Herb	Forest	Specimen
	<i>Asystasia malawiana</i> (Brummitt & Chisumpa)	Herb	Forest	Specimen
	<i>Brachystephanus africanus</i> (S.Moore)	Herb	Forest	Specimen
	<i>Brillantaisia cicatricosa</i> (Lindau)	Herb	Forest	Specimen
	<i>Dicliptera heterostegia</i> (Nees)	Herb	Forest	Specimen
	<i>Hypoestes aristata</i> (Vahl.) Roem.& Schult.	Herb	Forest	Specimen
	<i>Justicia asystasioides</i> (Lindau) M.E.Steiner	Shrub	Forest	Specimen
	<i>Mimulopsis arborescens</i> (C.B.Clarke)	Herb	Forest	Specimen
	<i>Mimulopsis solmsii</i> (Schweinf.)	Tree	Forest	2 Specimens
	<i>Phaulopsis imbricata</i> (Forssk.) Sweet ssp. <i>imbricata</i>	Herb	Forest	Specimen
	<i>Pseuderanthemum subviscosum</i> (C.B.Clarke) Stapf	Herb	Forest	Specimen
	<i>Sclerochiton hirsutus</i> (Desc.)	Shrub	Forest	Specimen
Amaranthaceae	<i>Achyranthes aspera</i> (L.) var. <i>pubescens</i> (Moq.) Townsend	Herb	Forest	Specimen
Annonaceae	<i>Annona senegalensis</i> (Pers.)	Shrub	Transition woodland	Specimen
	<i>Xylopia aethiopica</i> (Dunal) A.Rich.	Tree	Forest, woodland	Specimen
Apocynaceae	<i>Carissa bispinosa</i> (L.) Brenan	Shrub	Moist forest	Specimen
	<i>Carvalhoa campanulata</i> (K.Schum.)	Shrub	Woodland, forest	Specimen
	<i>Dictyophleba lucida</i> (K.Schum.) Pierre	Climber/liana	Forest	Specimen
	<i>Funtumia africana</i> (Benth.) Stapf	Tree	Forest	Specimen
	<i>Landolphia kirkii</i> (Hook.f.)	Climber/liana	Forest	Specimen
	<i>Oncinotis tenuiloba</i> (Stapf)	Climber/liana	Forest	Specimen
	<i>Rauvolfia caffra</i> (Sond.)	Tree	Forest	Specimen
	<i>Saba comorensis</i> (Bojer) Pichon	Climber/liana	Forest	2 Specimens
	<i>Tabernaemontana stapfiana</i> (Britten)	Tree	Forest	Specimen
	<i>Tabernaemontana ventricosa</i> (A.DC.)	Tree	Forest	Specimen
Araliaceae	<i>Cussonia arborea</i> (A.Rich.)	Tree	Transition woodland	2 Specimens
	<i>Cussonia spicata</i> (Thunb.)	Tree	Moist forest	Specimen
	<i>Polyscias fulva</i> (Hiern) Harms	Tree	Forest, moist forest	2 Specimens
	<i>Schefflera goetzenii</i> (Harms)	Climber/liana	Moist forest	Specimen

Asclepiadaceae	<i>Secamone alpini</i> (Schult.)	Climber/liana	Granitic dome	Specimen
	<i>Tylophora</i> sp.	Herb	Moist forest	Specimen
Asteraceae	<i>Adenostemma mauritianum</i> (DC.)	Herb	Forest	Specimen
	<i>Anisopappus chinensis</i> (L.) Hook.& Arn. ssp. <i>buchwaldii</i> (O.Hoffm.) S.Ortiz, Paiva	Herb	Granitic dome	Specimen
	<i>Bothriocline glomerata</i> (O.Hoffm.& Muschl.) C.Jeffrey	Herb	Forest	Specimen
	<i>Aspilia kotschyi</i> (Hochst.) Oliv. var. <i>kotschyi</i>	Herb	Moist forest	Specimen
	<i>Helichrysum forskahlii</i> (J.F.Gmel.) Hilliard & B.L.Burt	Herb	Granitic dome	Specimen
	<i>Mikania chenopodifolia</i> (Willd.)	Herb	Forest	Specimen
	<i>Senecio peltophorus</i> (Brenan)	Herb	Granitic dome	Specimen
Balsaminaceae	<i>Impatiens wallerana</i> (Hook.f.)	Herb	Forest	Specimen
	<i>Impatiens zombensis</i> (Baker)	Herb	Forest	Specimen
Cactaceae	<i>Rhipsalis baccifera</i> (J.Mill.) Stearn ssp. <i>mauritiana</i> (DC.) Barthlott	Epiphyte	Forest	2 Specimens
Campanulaceae	<i>Lobelia trullifolia</i> (Hemsl.) ssp. <i>trullifolia</i>	Herb	Woodland, granitic dome	Specimen
Cecropiaceae	<i>Myrianthus holstii</i> (Engl.)	Tree	Forest	Specimen
Celastraceae	<i>Maytenus acuminata</i> (L.f.) Loes.	Shrub	Forest	Specimen
	<i>Maytenus undata</i> (Thunb.) Blakelock	Tree	Forest, moist forest	Specimen
	<i>Mystroxydon aethiopicum</i> (Thunb.) Loes. (= <i>Cassine aethiopica</i>)	Tree	Moist forest	2 Specimens
Chrysobalanaceae	<i>Maranthes goetzeniana</i> (Engl.) Prance	Tree	Forest	Specimen
Chrysobalanaceae	<i>Parinari excelsa</i> (Sabine)	Tree	Forest, woodland	Specimen
Clusiaceae	<i>Garcinia kingaensis</i> (Engl.)	Tree	Forest	Specimen
	<i>Garcinia smeathmannii</i> (Planch & Triana) Oliv.	Tree	Forest	Specimen
	<i>Harungana madagascariensis</i> (Poir.)	Shrub	Woodland, forest	2 Specimens
	<i>Psorospermum febrifugum</i> (Spach)	Tree	Transition woodland	2 Specimens
Combretaceae	<i>Combretum paniculatum</i> (Vent.)	Climber/liana	Forest	2 Specimens
	<i>Pteleopsis myrtifolia</i> (M.A.Lawson) Engl.& Diels	Tree	Woodland, forest	2 Specimens
Connaraceae	<i>Agelaea pentagyna</i> (Lam.) Baill.	Climber/liana	Forest	2 Specimens
Convolvulaceae	<i>Ipomoea involucrata</i> (P.Beauv.)	Herb	Granitic dome	Specimen
	<i>Ipomoea wightii</i> (Choisy)	Herb	Forest	Specimen
Crassulaceae	<i>Crassula globularioides</i> (Britten)	Herb	Granitic dome	Specimen
Cucurbitaceae	<i>Coccinia barteri</i> (Hook.f.) Keay	Climber/liana	Forest	Specimen
Ebenaceae	<i>Diospyros abyssinica</i> (Hiern) F.White ssp. <i>abyssinica</i>	Tree	Forest, moist forest	Specimen
	<i>Diospyros whyteana</i> (Hiern) F.White	Tree	Moist forest	Specimen
Erythroxylaceae	<i>Erythroxylum emarginatum</i> (Thonn.)	Tree	Forest, woodland	Specimen
Euphorbiaceae	<i>Alchornea hirtella</i> Benth. <i>forma glabrata</i> (Müll.Arg.) Pax & K.Hoffm.	Shrub	Forest	Specimen
	<i>Antidesma vogelianum</i> (Müll.Arg.)	Shrub	Forest	Specimen
	<i>Bridelia micrantha</i> (Hochst.) Baill.	Tree	Forest, woodland	Specimen
	<i>Croton sylvaticus</i> (C.Krauss)	Tree	Moist forest	Specimen
	<i>Crotonogynopsis usambarica</i> (Pax)	Shrub	Forest	Specimen
	<i>Drypetes gerrardii</i> (Hutch.) var. <i>gerrardii</i>	Tree	Forest	Specimen
	<i>Drypetes gerrardii</i> (Hutch.) var. <i>grandifolia</i> (Radcl.-Sm.)	Tree	Forest	Specimen
	<i>Drypetes natalensis</i> (Harv.) Hutch.	Tree	Forest	Specimen

	<i>Erythrococca polyandra</i> (Pax & K.Hoffm.) Prain	Shrub	Forest	Specimen
	<i>Macaranga capensis</i> (Baill.) Sim	Tree	Woodland, forest	Specimen
	<i>Macaranga mellifera</i> (Prain)	Tree	Moist forest	Specimen
	<i>Phyllanthus nummulariifolius</i> (Poir.) var. <i>nummulariifolius</i>	Shrub	Forest, grasnitic dome	Specimen
	<i>Shirakiopsis elliptica</i> (Hochst.) Esser (= <i>Sapium ellipticum</i>)	Tree	Forest	Specimen
Flacourtiaceae	<i>Aphloia theiformis</i> (Vahl) Benn.	Tree	Moist forest	Specimen
	<i>Calancoba welwitschii</i> (Oliv.) Gilg	Tree	Forest	Specimen
	<i>Dovyalis macrocalyx</i> (Oliv.) Warb.	Tree	Forest, moist forest	Specimen
	<i>Rawsonia lucida</i> (Harv. & Sond.)	Tree	Forest	Specimen
Gesneriaceae	<i>Streptocarpus goetzei</i> (Engl.)	Herb	Forest	Specimen
Icacinaeae	<i>Apodytes dimidiata</i> (Arn.)	Tree	Moist forest	Specimen
	<i>Pyrenacantha kirkii</i> (Baill.)	Climber/liana	Forest	Specimen
Lamiaceae	<i>Achyropermum carvalhi</i> (Gürke)	Shrub	Forest	Specimen
	<i>Aeollanthus buchnerianus</i> (Briq.)	Herb	Granitic dome	Specimen
	<i>Plectranthus melleri</i> (Baker)	Herb	Moist forest	Specimen
	<i>Plectranthus sanguineus</i> (Britten)	Herb	Granitic dome	Specimen
	<i>Plectranthus stenosphon</i> (Baker)	Herb	?	Specimen
	<i>Tetradenia riparia</i> (Hochst.) Codd	Shrub	Granitic dome	2 Specimens
	<i>Vitex buchananii</i> (Gürke)	Tree	Forest	Specimen
	<i>Vitex doniana</i> (Sweet)	Tree	Transition woodland	Specimen
	<i>Cryptocarya liebertiana</i> (Engl.)	Tree	Forest, moist forest	Specimen
Leg: Caesalpinoideae	<i>Cassia angolensis</i> (Hiern)	Tree	Forest	Specimen
	<i>Erythrophleum suaveolens</i> (Guill. & Perr.) Brenan	Tree	Forest	2 Specimens
Leg: Mimosoideae	<i>Acacia pentagona</i> (Schumach.) Hook f.	Climber/liana	Forest	Specimen
	<i>Albizia adianthifolia</i> (Schumach.) W.F.Wight	Tree	Forest	Specimen
	<i>Albizia gummifera</i> (J.F.Gmel.) C.A.Sm.	Tree	Forest	Specimen
	<i>Newtonia buchananii</i> (Baker) G.C.C.Gilbert & Boutique	Tree	Forest	2 Specimens
Leg: Papilionoideae	<i>Aeschynomene nodulosa</i> (Baker) Baker var. <i>nodulosa</i>	Shrub	Woodland, granitic dome	Specimen
	<i>Craibia brevicaudata</i> (Valke) Dunn	Tree	Forest	Specimen
	ssp. <i>baptistarum</i> (Buttner) J.B.Gillett			
	<i>Dalbergia boehmii</i> (Taub.)	Tree	Transition woodland	Specimen
	<i>Dalbergia lactea</i> (Vatke)	Climber/liana	Forest	2 Specimens
	<i>Eriosema parviflorum</i> (E.Mey.)	Herb	Transition woodland	Specimen
	<i>Erythrina livingstoniana</i> (Baker)	Tree		Specimen
	<i>Indigofera lyallii</i> (Baker) ssp. <i>nyassica</i> (J.B.Gillett)	Shrub	Forest	Specimen
	<i>Kotschya recurvifolia</i> (Taub.) F.White	Shrub	Granitic dome	Specimen
	<i>Millettia lasiantha</i> (Dunn)	Climber/liana	Forest	Specimen
	<i>Mundulea sericea</i> (Willd.) A.Chev.	Shrub	Forest	Specimen
	<i>Pericopsis angolensis</i> (Baker) Meeuwen	Tree	Transition woodland	2 Specimens
	<i>Pterocarpus angolensis</i> (DC.)	Tree	Transition woodland	2 Specimens
Loganiaceae	<i>Anthocleista grandiflora</i> (Gilg)	Tree	Forest	2 Specimens
	<i>Mostuea brunonis</i> (Didr.) var. <i>brunonis</i>	Shrub	Forest	Specimen
	<i>Nuxia congesta</i> (Fresen.)	Tree	Moist forest	2 Specimens

	<i>Strychnos cf. mitis</i> (S.Moore)	Tree	Forest	Specimen
Loranthaceae	<i>Agelanthus zizyphifolius</i> (Engl.) Polhill & Wiens	Epiphyte	Moist forest	Specimen
	ssp. <i>vittalius</i> (Engl.) Polhill & Wiens			
	<i>Erianthemum dregei</i> (Eckl. & Zeyh.) Tiegh.	Epiphyte	Moist forest	Specimen
	<i>Helixanthera schizocalyx</i> (T.Harris, I.Darbysh. & Polhill)	Epiphyte	Moist forest	Specimen
Melastomataceae	<i>Dissotis</i> sp.	Shrub	Granitic dome	2 Specimens
	<i>Memecylon sansibaricum</i> (Taub.)	Tree	Forest	Specimen
	<i>Memecylon</i> sp. – unmatched @ K	Shrub	Forest	Specimen
Meliaceae	<i>Khaya anthotheca</i> (Welw.) C.DC.	Tree	Forest	Specimen
Meliantaceae	<i>Bersama abyssinica</i> (Fresen.)	Tree	Forest	2 Specimens
Molluginaceae	<i>Corrigiola drymerioides</i> (Baker f.)	Herb	Granitic dome	Specimen
Monimiaceae	<i>Xymalos monospora</i> (Harv.) Warb.	Tree	Moist forest	Specimen
Moraceae	<i>Ficus sansibarica</i> (Warb.)	Tree	Forest	2 Specimens
	<i>Ficus scassellatii</i> (Pamp.)	Tree	Moist forest	2 Specimens
	<i>Ficus thonningii sensu</i> (White)	Tree	Forest	2 Specimens
	<i>Trilepisium madagascariense</i> (DC.)	Tree	Forest	Specimen
Myrothamnaceae	<i>Myrothamnus flabellifolius</i> (Welw.)	Shrub	Granitic dome	Specimen
Myrsinaceae	<i>Maesa lanceolata</i> (Forssk.)	Tree	Moist forest	2 Specimens
	<i>Myrsine africana</i> (L.)	Shrub	Granitic dome	Specimen
	<i>Rapanea melanophloeos</i> (L.) Mez	Tree	Moist forest	Specimen
Myrtaceae	<i>Eugenia capensis</i> (Eckl. & Zeyh.) Sond. ssp. <i>gracilipes</i> F.White	Tree	Forest	Specimen
	<i>Eugenia capensis</i> (Eckl. & Zeyh.) Sond. ssp. <i>nyassensis</i> (Engl.) F.White	Tree	Moist forest	Specimen
	<i>Syzygium cordatum</i> (Krauss)	Tree	Woodland, forest	Specimen
	<i>Syzygium guineense</i> (Willd.) DC. ssp. <i>afromontanum</i> (F.White)	Tree	Moist forest	2 Specimens
Ochnaceae	<i>Ochna holstii</i> (Engl.)	Tree	Moist forest	2 Specimens
Olacaceae	<i>Strombosia scheffleri</i> (Engl.)	Tree	Forest	Specimen
Oleaceae	<i>Chionanthus foveolatus</i> (E.Mey.) Stearn	Tree	Forest	Specimen
	<i>Jasminum brachyscyphum</i> (Baker)	Climber/liana	Moist forest	Specimen
	<i>Olea capensis</i> (L.)	Tree	Moist forest	Specimen
Piperaceae	<i>Piper capense</i> (L.) f. var. <i>capense</i>	Herb	Forest	Specimen
Pittosporaceae	<i>Pittosporum viridiflorum</i> (Sims)	Tree	Moist forest	Specimen
Polygalaceae	<i>Securidaca longipedunculata</i> (Fresen.)	Tree	Transition woodland	Specimen
Proteaceae	<i>Faurea racemosa</i> (Farmar)	Tree	Moist forest	Specimen
	<i>Protea cf. caffra</i> (Meisn.)	Shrub	Transition woodland	Specimen
Rhamnaceae	<i>Lasiodiscus usambarensis</i> (Engl.)	Tree	Forest	Specimen
Rhizophoraceae	<i>Cassipourea malosana</i> (Baker) Alston	Tree	Moist forest	2 Specimens
Rosaceae	<i>Prunus africana</i> (Hook.f.) Kalkman	Tree	Moist forest	2 Specimens
	<i>Rubus pinnatus</i> (Willd.)	Shrub	Forest	Specimen
Rubiaceae	<i>Aidia micrantha</i> (K.Schum.) F.White var. <i>msonju</i> (K.Krause) Petit	Tree	Forest	Specimen
	<i>Canthium</i> sp.	Tree	Forest	Specimen
	<i>Chassalia parvifolia</i> (K.Schum.)	Shrub	Forest	Specimen
	<i>Coffea mufindiensis</i> (Bridson) ssp. <i>australis</i> (Bridson)	Shrub	Forest	Specimen
	<i>Craterispermum schweinfurthii</i> (Hiern) (= <i>C. laurinum</i>)	Shrub	Forest	Specimen

	<i>Didymosalpinx norae</i> (Swynn.) Keay	Shrub	?	Specimen
	<i>Heinsenias diervilleoides</i> (K.Schum.) ssp. <i>diervilleoides</i>	Tree	Forest	Specimen
	<i>Ixora scheffleri</i> (K.Schum. & K.Krause)	Shrub	Moist forest	Specimen
	<i>Keetia gueinzii</i> (Sond.) Bridson (= <i>Canthium gueinzii</i>)	Climber/liana	Moist forest	Specimen
	<i>Lasianthus kilimandscharicus</i> (K.Schum.)	Shrub	Moist forest	Specimen
	<i>Oxyanthus goetzei</i> (K.Schum.)	Shrub	Forest	Specimen
	<i>Oxyanthus speciosus</i> (DC.) ssp. <i>stenocarpus</i> (K.Schum.) Bridson	Tree	Forest	Specimen
	<i>Pauridiantha symplocoides</i> (S.Moore) Bremek.	Shrub	Moist forest	Specimen
	<i>Pavetta gurueënsis</i> (Bridson)	Shrub	Moist forest	Specimen
	<i>Pavetta</i> sp.	Herb	Forest	Specimen
	<i>Polysphaeria lanceolata</i> (Hiern)	Shrub	Forest, moist forest	Specimen
	<i>Psychotria ealaensis</i> (De Wild.)	Climber/liana	Moist forest	Specimen
	<i>Psychotria zombamontana</i> (Kuntze) Petit	Shrub	Moist forest	Specimen
	<i>Rothmannia manganjae</i> (Hiern) Keay	Tree	Woodland, forest	Specimen
	<i>Rutidea orientalis</i> (Bridson)	Climber/liana	Moist forest	Specimen
	<i>Rytigynia</i> sp.	Tree	Forest	Specimen
	<i>Rytigynia uhligii</i> (K.Schum. & K.Krause) Verdc.	Shrub	Moist forest	Specimen
	<i>Tricalysia acocantheroides</i> (K.Schum.)	Shrub	Moist forest	Specimen
	<i>Tricalysia pallens</i> (Hiern)	Tree	Forest	Specimen
Rutaceae	<i>Toddalia asiatica</i> (L.) Lam.	Climber/liana	Moist forest	2 Specimens
	<i>Vepris</i> cf. <i>amaniensis</i> (Engl.) Mziray	Shrub	Moist forest	1
	<i>Vepris nobilis</i> (Delile) Mziray	Tree	Forest, moist forest	Specimen
	<i>Vepris</i> sp. nov. near <i>V. bachmannii</i>	Tree	Forest	Specimen
	<i>Zanthoxylum gillettii</i> (De Wild.) P.G. Waterman	Tree	Forest	Specimen
Sapindaceae	<i>Allophylus chaunostachys</i> (Gilg)	Shrub	Forest	Specimen
	<i>Aporrhiza paniculata</i> (Radkl.) (= <i>A. nitida</i>)	Tree	Forest	Specimen
	<i>Blighia unijugata</i> (Baker)	Tree	Forest	Specimen
	<i>Haplocoelum foliolosum</i> (Hiern) Bullock	Tree	Forest	Specimen
Sapotaceae	<i>Chrysophyllum gorungosanum</i> (Engl.)	Tree	Forest	2 Specimens
	<i>Englerophytum magalimontanum</i> (Sond.) T.D.Penn.	Tree	Forest, moist forest	Specimen
	<i>Synsepalum brevipes</i> (Baker f.) T.D.Penn.	Tree	Forest	Specimen
	<i>Synsepalum cerasiferum</i> (Welw.) T.D.Penn.	Shrub	Forest, woodland	Specimen
	<i>Synsepalum muelleri</i> (Kupicha) T.D.Penn.	Tree	Forest	Specimen
Scrophulariaceae	<i>Halleria lucida</i> (L.)	Shrub	Granitic dome	Specimen
Solanaceae	<i>Solanum richardii</i> (Dunal) var. <i>richardii</i>	Herb	Granitic dome	Specimen
Sterculiaceae	<i>Cola greenwayi</i> (Brenan)	Tree	Forest	Specimen
Thymelaeaceae	<i>Peddiea fischeri</i> (Engl.)	Tree	Forest	Specimen
Ulmaceae	<i>Celtis gomphophylla</i> (Baker)	Tree	Forest	2 Specimens
	<i>Trema orientalis</i> (L.) Blume	Tree	Woodland, forest	Specimen
Urticaceae	<i>Laportea mooreana</i> (Hiern) Chew	Herb	Forest	Specimen
	<i>Procris crenata</i> (C.B.Rob.)	Climber/liana	Forest	Specimen
	<i>Urera trinervis</i> (Hochst.) Friis & Immelman	Climber/liana	Forest	2 Specimens
Verbenaceae	<i>Cleodendrum cephalanthum</i> (Oliv.) ssp.	Shrub	Moist forest	Specimen

	<i>swynnertonii</i> (S.Moore) Verdc.			
Violaceae	<i>Rinorea angustifolia</i> (Thouars) Baill.	Shrub	Forest, moist forest	Specimen
	<i>Rinorea ferruginea</i> (Engl.)	Tree	Forest	Specimen
Viscaceae	<i>Viscum cylindricum</i> (Polhill & Wiens)	Epiphyte	Moist forest	Specimen
	<i>Viscum triflorum</i> (DC.)	Epiphyte	Moist forest	Specimen
Vitaceae	<i>Cissus cornifolia</i> (Baker) Planch.	Climber/liana	Forest	Specimen
	<i>Cissus petiolata</i> (Hook.f.)	Climber/liana	Forest	Specimen
	<i>Cyphostemma adenocaula</i> (A.Rich.) Desc.	Climber/liana	Forest	Specimen

SUPPLEMENTARY TABLE S2 Bird checklist for Mount Mabu. The bird fauna of Mabu was surveyed by C. Spottiswoode and E. Herrmann in December 2005 (Spottiswoode et al., 2008), and by F. Dowsett-Lemaire, R.J. Dowsett and L.D.C. Fishpool in October 2008 (Dowsett-Lemaire, 2010). For identifications see Dowsett-Lemaire & Dowsett (2006).

Family	Species	Habitat ¹	Altitudinal limits ¹	Status ²
Accipitridae	African cuckoo hawk <i>Aviceda cuculoides</i>	Forest, woodland	Low	Rare or vagrant
	European honey buzzard <i>Pernis apivorus</i>	Forest	Low	Rare or vagrant
	Palm-nut vulture <i>Gypohierax angolensis</i>	Forest	High	Rare or vagrant
	Brown snake eagle <i>Circaetus cinereus</i>	Forest, woodland	Low	Fairly frequent
	Southern banded snake eagle <i>Circaetus fasciolatus</i>	Forest, woodland	Low–high	Fairly frequent
	African harrier hawk <i>Polyboroides typus</i>	Forest, woodland	Low–high	Fairly frequent
	African goshawk <i>Accipiter tachiro</i>	Forest	Low–high	Common
	Lizard buzzard <i>Kaupifalco monogrammicus</i>	Transition woodland	Low	Rare or vagrant
	Common buzzard <i>Buteo buteo</i>	Transition woodland	Low	Rare or vagrant
	*Augur buzzard <i>Buteo augur</i> (spotted by L.D.C. Fishpool)	Transition woodland	Low	Rare or vagrant
	Lesser spotted eagle <i>Aquila pomarina</i>	Forest, granitic dome	High	Rare or vagrant
	Ayres's hawk eagle <i>Hieraaetus ayresii</i>	Forest, woodland	Low	Few records
	Crowned eagle <i>Stephanoaetus coronatus</i>	Forest	Medium–high	Common
Falconidae	Peregrine falcon <i>Falco peregrinus</i>	Granitic dome	High	Fairly frequent
Phasianidae	Hildebrandt's francolin <i>Francolinus hildebrandti</i>	Forest edge, grassland & scrub	Low–high	Fairly frequent
	Red-necked spurfowl <i>Francolinus afer</i>	Grassland & scrub	Low	Fairly frequent
Numididae	*Crested guinea fowl <i>Guttera pucherani</i> (spotted by hunter Ofelio Kavaliyawo)	Forest	Low	Rare or vagrant
Columbidae	Rameron pigeon <i>Columba arquatrix</i>	Forest	High	Common
	Eastern bronze-naped pigeon <i>Columba delegorguei</i>	Forest	Medium	Common
	Lemon dove <i>Aplopelia larvata</i>	Forest	High	Common
	Blue-spotted wood dove <i>Turtur afer</i>	Forest, woodland	Low	Fairly frequent
Psittacidae	Tambourine dove <i>Turtur tympanistris</i>	Forest	Low–high	Common
	*Brown-necked parrot <i>Poicephalus robustus</i> (spotted by hunter Ofelio Kavaliyawo)	Forest & woodland	Low–high	Few records
Musophagidae	Livingstone's turaco <i>Tauraco livingstonii</i>	Forest	Low–high	Common
Cuculidae	Red-chested cuckoo <i>Cuculus solitarius</i>	Forest, woodland	Low	Rare or vagrant
	African emerald cuckoo <i>Chrysococcyx cupreus</i>	Forest	Low	Rare or vagrant
	Klaas's cuckoo <i>Chrysococcyx klaas</i>	Forest, woodland	Low	Fairly frequent
	Yellowbill <i>Ceuthmochares aereus</i>	Forest	Low	Rare or vagrant
	Burchell's coucal <i>Centropus superciliosus</i>	Forest edge, grassland & scrub	Low–medium	Common
Tytonidae	Barn owl <i>Tyto alba</i>	Woodland, commensal	Low	Few records

Strigidae	Spotted eagle owl <i>Bubo africanus</i>	(tea house) Woodland, commensal	Low	Few records
Apodidae	African wood owl <i>Strix woodfordii</i>	Forest	Low–high	Common
	African palm swift <i>Cypsiurus parvus</i>	Transition woodland	Low	Few records
Trogonidae	Common swift <i>Apus apus</i>	Transition woodland	Low	Rare or vagrant
	White-rumped swift <i>Apus caffer</i>	Woodland, commensal	Low	Few records
	Mottled swift <i>Tachymarptis aequatorialis</i>	Granitic dome	Low–high	Fairly frequent
	Alpine swift <i>Tachymarptis melba</i>	Granitic dome	High	Few records
Alcedinidae	Narina's trogon <i>Apaloderma narina</i>	Forest	Low– medium	Common
	Bar-tailed trogon <i>Apaloderma vittatum</i>	Forest	High	Common
	African pygmy kingfisher <i>Ceyx pictus</i>	Forest edge	Low	Fairly frequent
Meropidae	Grey-headed kingfisher <i>Halcyon leucocephala</i>	Transition woodland	Low	Rare or vagrant
	Little bee-eater <i>Merops pusillus</i>	Grassland & scrub	Low	Rare or vagrant
	Madagascar bee-eater <i>Merops superciliosus</i>	Transition woodland	Low	Few records
Coraciidae	Eurasian bee-eater <i>Merops apiaster</i>	Forest, woodland	Low–high	Fairly frequent
	Broad-billed roller <i>Eurystomus glaucurus</i>	Transition woodland	Low	Few records
Bucerotidae	Crowned hornbill <i>Tockus alboterminatus</i>	Forest, woodland	Low	Few records
Lybiidae	Silvery-cheeked hornbill <i>Bycanistes brevis</i>	Forest	Low–high	Common
	White-eared barbet <i>Stactolaema leucotis</i>	Forest	Low– medium	Few records
	Green barbet <i>Stactolaema olivacea</i>	Forest	Low–high	Common
Indicatoridae	Yellow-rumped tinkerbird <i>Pogoniulus bilineatus</i>	Forest, woodland	Low–high	Common
	Scaly-throated honeyguide <i>Indicator variegatus</i>	Forest, woodland	Low– medium	Fairly frequent
	Lesser honeyguide <i>Indicator minor</i>	Forest	Low	Few records
Picidae	Pallid honeyguide <i>Indicator meliphilus</i>	Forest	Low– medium	Few records
	Golden-tailed woodpecker <i>Campethera abingoni</i>	Forest	Medium– high	Few records
Eurylaimidae	Cardinal woodpecker <i>Dendropicos fuscescens</i>	Woodland, forest	Low	Few records
	African broadbill <i>Smithornis capensis</i>	Forest	Low	Fairly frequent
Hirundinidae	Black saw-wing <i>Psalidoprocne pristoptera</i>	Forest edge	Low– medium	Fairly frequent
	Lesser striped swallow <i>Cecropis abyssinica</i>	Woodland, commensal	Low	Fairly frequent
	Barn swallow <i>Hirundo rustica</i>	Woodland, forest	Low–high	Fairly frequent
	Eurasian house martin <i>Delichon urbicum</i>	Granitic dome, woodland	Low–high	Fairly frequent
Motacillida	*Mountain wagtail <i>Motacilla clara</i> (spotted by M. Curran)	Granitic dome & forest	Low	Few records
	Striped pipit <i>Anthus lineiventris</i>	Granitic dome, grassland & scrub	High	Few records
Campephagidae	Grey cuckooshrike <i>Coracina caesia</i>	Forest	Medium	Fairly frequent

Pycnonotidae	Stripe-cheeked greenbul <i>Andropadus milanjensis</i>	Forest	Medium–high	Common
	Little greenbul <i>Andropadus virens</i>	Forest	Low–high	Common
	*Yellow-bellied greenbul <i>Chlorocichla flaviventris</i> (spotted by C. Spottiswoode)	Forest	Low	Few records
	Grey-olive greenbul <i>Phyllastrephus cerviniventris</i>	Forest	Low	Fairly frequent
	Cabanis’s greenbul <i>Phyllastrephus cabanisi</i>	Forest	Low–high	Common
	Yellow-streaked greenbul <i>Phyllastrephus flavostriatus</i>	Forest	Low–high	Common
	Common bulbul <i>Pycnonotus barbatus</i>	Woodland, forest edge	Low–high	Common
	Eastern nicator <i>Nicator gularis</i>	Forest	Low–medium	Common
Turdidae	White-starred robin <i>Pogonocichla stellata</i>	Forest	High	Common
	Swynnerton’s robin <i>Swynnertonia swynnertoni</i>	Forest	High	Fairly frequent
	East Coast akalat <i>Sheppardia gunningi</i>	Forest	Low–medium	Common
	Cape robin chat <i>Cossypha caffra</i>	Grassland & scrub, & forest edge	High	Fairly frequent
	Red-capped robin chat <i>Cossypha natalensis</i>	Forest	Low–high	Common
	Eastern bearded scrub robin <i>Cercotrichas quadrivirgata</i>	Forest	Low	Common
	White-browed scrub robin <i>Cercotrichas leucophrys</i>	Transition woodland	Low	Few records
	Cholo alethe <i>Alethe choloensis</i>	Forest	Medium–high	Common
Sylviidae	Spotted ground thrush <i>Zoothera guttata</i>	Forest	Medium	Rare or vagrant
	Kurrichane thrush <i>Turdus libonyanus</i>	Transition woodland	Low	Rare or vagrant
	Red-faced crombec <i>Sylvietta whytii</i>	Woodland, forest edge	Low	Fairly frequent
	Yellow-throated warbler <i>Phylloscopus ruficapilla</i>	Forest	Medium–high	Common
	Garden warbler <i>Sylvia borin</i>	Forest	Low	Rare or vagrant
	Wailing cisticola <i>Cisticola lais</i>	Grassland & scrub, & granitic dome	High	Common
	Red-faced cisticola <i>Cisticola erythrops</i>	Grassland & scrub	Low	Fairly frequent
	Tawny-flanked prinia <i>Prinia subflava</i>	Grassland & scrub	Low	Fairly frequent
Cisticolidae	Red-winged warbler <i>Heliolais erythropterus</i>	Grassland & scrub	Low	Few records
	Yellow-breasted apalis <i>Apalis flavida</i>	Forest	Low	Fairly frequent
	Namuli apalis <i>Apalis (thoracica) lynesii</i>	Forest	High	Rare or vagrant
	Black-headed apalis <i>Apalis melanocephala</i>	Forest	Low–high	Common
	Grey-backed camaroptera <i>Camaroptera brachyuran</i>	Woodland, forest	Low–medium	Common
	*Spotted flycatcher <i>Muscicapa striata</i> (spotted by C. Spottiswoode)	Transition woodland	Low	Few records
	Ashy flycatcher <i>Muscicapa caerulescens</i>	Woodland, forest edge	Low	Common
	Lead-coloured flycatcher <i>Myioparus plumbeus</i>	Woodland, forest	Low–medium	Fairly common
Platyteiridae	Cape (Malaŵi) batis <i>Batis capensis dimorpha</i>	Forest	High	Few records
	Mozambique batis <i>Batis soror</i>	Woodland,	Low–	Fairly frequent

Monarchidae	Blue-mantled flycatcher <i>Trochocercus cyanomelas</i>	forest edge Forest	medium Low–medium	Common
	African paradise flycatcher <i>Terpsiphone viridis</i>	Forest	Medium	Few records
Timaliidae	Dapple-throat <i>Modulatrix orostruthus</i>	Forest	High	Rare or vagrant
Paridae	Rufous-bellied tit <i>Parus rufiventris</i>	Transition woodland	Low	Rare or vagrant
Nectariniidae	Violet-backed sunbird <i>Anthreptes longuemarei</i>	Forest	Low	Rare or vagrant
	Collared sunbird <i>Hedydipna collaris</i>	Forest	Low	Common
	Olive sunbird <i>Cyanomitra olivacea</i>	Forest	Low–high	Common
	Amethyst sunbird <i>Chalcomitra amethystine</i>	Transition woodland	Low	Fairly frequent
	Yellow-bellied sunbird <i>Cinnyris venustus</i>	Woodland & Grassland	Low–high	Fairly frequent
Zosteropidae	Yellow white-eye <i>Zosterops senegalensis</i>	Forest, woodland	Low–high	Common
Oriolidae	Green-headed oriole <i>Oriolus chlorocephalus</i>	Forest	Low–medium	Common
Malaconotidae	Black-fronted bushshrike <i>Malaconotus nigrifrons</i>	Forest	Medium	Common
	Brown-headed tchagra <i>Tchagra australis</i>	Grassland & woodland	Low	Fairly frequent
	Southern puffback <i>Dryoscopus cubla</i>	Woodland & forest	Low–medium	Common
	Tropical boubou <i>Laniarius aethiopicus</i>	Forest edge & grassland	Low–high	Fairly frequent
Dicruridae	Square-tailed drongo <i>Dicrurus ludwigii</i>	Forest	Low–medium	Common
Corvidae	White-necked raven <i>Corvus albicollis</i>	Granitic dome & woodland	Low–high	Fairly frequent
Sturnidae	Red-winged starling <i>Onychognathus morio</i>	Granitic dome & forest edge	Medium–high	Few records
Ploceidae	*Bertram's weaver <i>Ploceus bertrandi</i> (spotted by C. Spottiswoode)	Forest edge & woodland	Low	Rare or vagrant
	Spectacled weaver <i>Ploceus ocularis</i>	Forest edge	Low	Few records
	Dark-backed weaver <i>Ploceus bicolor</i>	Forest	Low–high	Common
	*Grosbeak weaver <i>Amblyospiza albifrons</i> (spotted by C. Spottiswoode)	Forest edge	Low	Rare or vagrant
Estrildidae	Green twinspot <i>Mandingoa nitidula</i>	Forest & forest edge	Low–high	Common
	Blue-billed firefinch <i>Lagonosticta rubricata</i>	Forest edge	Low	Few records
	Swee waxbill <i>Estrilda melanotis</i>	Granitic dome & grassland	High	Rare or vagrant
	Common waxbill <i>Estrilda astrild</i>	Grassland & scrub	Low	Common
	Bronze mannikin <i>Spermestes cucullatus</i>	Grassland & scrub	Low	Common
	Red-backed mannikin <i>Spermestes bicolor</i>	Forest edge & woodland	Low	Common
Fringillidae	Yellow-fronted canary <i>Serinus mozambicus</i>	Grassland & woodland	Low	Fairly frequent

*Species noted by other observers, followed by names: C. Spottiswoode (December 2005), L.D.C. Fishpool (October 2008), M. Curran (October 2008), Ofelio Kavaliyowo (hunter).

¹Low, 400–1,000 m; Medium, 1,000–1,400 m; High, c.1,400 m and above

²Common, recorded daily in relevant habitat

SUPPLEMENTARY TABLE S3 Small mammal species collected or recorded from the Mabu massif. Small mammals were opportunistically surveyed, mainly by J. Bayliss and L. Sabão, over several visits, and identified by P. Taylor (Taylor, 2012) and A. Monadjem (Monadjem 2010a,b). Bats were opportunistically collected by J. Bayliss during 2005–2009, over several visits. In 2008 a more systematic survey was undertaken by M. Curran and M. Kopp (Timberlake et al. 2012). Larger mammals were recorded opportunistically. R.J. Dowsett undertook a more detailed survey in October 2008 (Dowsett-Lemaire & Dowsett, 2009). Nomenclature follows Musser & Carleton (2005), and Monadjem et al. (2010b) for bats.

Family (by Order)	Species	Habitat	Altitude	Status
Chiroptera				
Pteropodidae	<i>Epomophorus wahlbergi</i>	Moist forest	1,300	
	<i>Rousettus aegyptiacus</i>	Tea plantation	550	
Rhinolophidae	<i>Rhinolophus blasii</i>	River in moist forest	1,000	
	<i>Rhinolophus clivosus</i>	Moist forest	±1000	
	<i>Rhinolophus landeri</i>	River in moist forest	1,000	
	<i>Rhinolophus mabuensis</i>	Tea plantation, moist forest	550–1,000	
Hipposideridae	<i>Hipposideros ruber</i>	Moist forest	±1,000	
Miniopterinae	<i>Miniopterus cf. fraterculus</i>	Moist forest	980–1,300	
	<i>Miniopterus cf. inflatus/natalensis</i>	Moist forest	980	
Vespertilionidae	<i>Kerivoula cf. phalaena**</i>	Moist forest	980	
	<i>Myotis tricolor</i>	Moist forest	1,300	
	<i>Laephotis botswanae*</i>	Tea plantation	550	
Insectivora				
Soricidae	<i>Crocidura silacea</i>	Moist forest	1,000	
	<i>Crocidura luna</i>	Moist forest	1,000	
	<i>Crocidura olivieri</i>	Moist forest	1,000	
Macroscelidea				
Macroscelididae	Four-toed elephant shrew <i>Petrodromus tetradactylus</i>	Moist forest		Sight record only
	Chequered elephant shrew <i>Rhynchocyton cirnae</i>	Moist forest		Sight record only
Lagomorpha	Red rock hare <i>Pronolagus rupestris</i>	Rocky areas	1,600	Sight record only
Rodentia				
Sciuridae	Sun squirrel <i>Heliosciurus mutabilis</i>	Moist forest & secondary		Sight record only
Muridae	Narrow-footed woodland mouse <i>Grammomys dolichurus</i>	Moist forest	1,000	
	Brush-furred mouse <i>Lophuromys aquilus</i>	Moist forest	1,000	
	<i>Mus triton</i>	Moist forest		Sight record only
Cricetomyinae	Soft-furred rat <i>Praomys delectorum</i>	Moist forest	1,000	
	Lesser pouched rat <i>Beamys major*</i>	Moist forest	1,000	
Hyracoidea				
Procaviidae	Cape rock hyrax <i>Procavia capensis</i>	Rocky areas & tea plantation		Sight record only
	Yellow-spotted hyrax <i>Heterohyrax brucei</i>	Rocky areas	1,000	Sight record only

*, new record for Mozambique; **, new record for southern African

SUPPLEMENTARY TABLE S4 Herpetofauna collected or recorded from the Mabu massif. The herpetofauna was opportunistically surveyed by J. Bayliss during 2005–2008, resulting in the discovery of several new species (Branch & Bayliss, 2009; Branch & Tolley, 2010; Branch et al., unpubl. data). In May 2009 a more detailed survey was undertaken by W.R. Branch and W. Conradie (Branch, 2011). Specimens were identified by W.R. Branch (Branch, 1998).

Family (by Class)	Species	Habitat	Altitudinal limits*	Status
Reptilia–Sauria				
Scincidae	Variable skink <i>Trachylepis varia</i>	Shambas & old tea estate house, south-east foothills	Low	Common
	Rainbow skink <i>Trachylepis margatiiter</i>	Shambas & old tea estate house, south-east foothills	Low	Fairly frequent
	Speckled writhing skink <i>Moluchus afrum</i>	Shambas & old tea estate house, south-east foothills	Low	Few records
	Black burrowing skink <i>Melanoseps</i> cf. <i>afer</i>	Mid altitude forest & upper slopes	Medium	Few records
Agamidae	Mozambique agama <i>Agama mossambica</i>	Shambas & old tea estate house, south-east foothills	Low	Common
Chamaeleonidae	Sword-snouted chameleon <i>Trioceros melleri</i>	Low & mid altitude forest fringe	Low	Few records
	Bayliss' chameleon <i>Nadzikambia baylissi</i>	Mid altitude forest & upper slopes	Medium	Few records
	Mt Mabu leaf chameleon <i>Rhampholeon</i> nov. sp.	Mid altitude forest & upper slopes	Medium	Common
Gekkonidae	Flat-headed tropical house gecko <i>Hemidactylus platycephalus</i>	Shambas & old tea estate house, south-east foothills	Low	Common
Reptilia–Serpentes				
Natricidae	Forest marsh snake <i>Natriciteres sylvatica</i>	Low & mid altitude forest	Low	?
Colubridae	Black bush snake <i>Philothamnus</i> cf. <i>carinatus</i>	Mid altitude forest & upper slopes	Medium	Few records
	Tree snake <i>Dipsadoboa</i> sp. nov	Mid altitude forest & upper slopes	Medium	Few records
Elapidae	Forest cobra <i>Naja melaoleuca</i>	Low & mid altitude forest	Low	?
Viperidae	Gaboon viper <i>Bitis gabonica</i>	Low & mid altitude forest	Low	?
	Mt Mabu forest viper <i>Atheris mabuensis</i>	Mid altitude forest & upper slopes	Medium	Few records
Amphibia				
Arthroleptidae	Lujeri squeaker <i>Arthrolepis</i> 'Luyeri' - new species	Shambas & old tea estate house, south-east foothills	Low–medium	Fairly frequent
	Mt Mulanje squeaker <i>Arthrolepis</i> sp. (large) – possible new species – central & northern Mozambique	Shambas & old tea estate house, south-east foothills	Low–medium	Common
	Dwarf squeaker <i>Arthroleptis xenodactyloides</i>	Shambas & old tea estate house, south-east foothills	Low–medium	Common
	Yellow-spotted tree frog <i>Leptopelis flavimaculata</i>	Mid altitude forest & upper slopes	Medium	Few records
Hyperoliidae	Leaf-folding frog <i>Afrixalus</i> sp.	Mid altitude forest & upper slopes	Medium	?
	Golden-spotted reed frog <i>Hyperolius substriatus</i>	Mid altitude forest & upper slopes	Medium	Fairly frequent
Bufoidea	Flat-backed toad <i>Amietophrynus maculatus</i>	Shambas & old tea estate house, south-east foothills	Low–medium	Common

*Low, 400–1,000 m; Medium, 1,000–1,400 m; High, c.1,400 m and above

SUPPLEMENTARY TABLE S5 Butterfly species collected or recorded from the Mabu massif. The butterflies were studied in detail in December 2005, January 2006, June 2008, September 2008, October 2008 and November 2010. Specimens were collected by J. Bayliss, C. Congdon, S. Collins, M. Hassan, I. Bampton†, R.J. Dowsett and S. Georgiadis. A total of 203 species of butterfly were recorded from the Mabu area. Identifications were confirmed by Steve Collins, African Butterfly Research Institute, Nairobi, Kenya. Species arrangement follows Carcasson's African Butterflies (Ackery et al. 1995) taking account of some recent changes; nomenclature follows Williams (2012). Species new to Mozambique (*) are those not listed as occurring in Mozambique in Ackery et al. (1995), Cabral (2000), d'Abrera (1980), Alan Gardiner (unpubl. data), Kielland (1990), Libert (1999, 2004), Pringle et al. (1994) and Williams (2012).

Species (by family)	Habitat
Hesperiidae	
Coeliadinae	
<i>Coeliades forestan</i> (Stoll, 1782)	Ubiquitous
Pyrginae	
<i>Celaenorrhinus galenus</i> (Fabricius, 1793)	Forest
<i>Celaenorrhinus handmani</i> * (Collins & Congdon, 1998)	Forest
<i>Tagiades flesus</i> (Fabricius, 1781)	Ubiquitous
<i>Eagris sabadius</i> * (Gray, 1832)	Forest
<i>Eretis melania</i> (Mabille, 1891)	Woodland
<i>Sarangesa lucidella</i> * (Mabille, 1891)	Woodland
<i>Sarangesa thecla</i> * (Plötz, 1879)	Forest
<i>Spialia depauperata</i> (Strand, 1911)	Woodland
<i>Spialia dromus</i> (Plötz, 1884)	Forest
<i>Abantis zambesiaca</i> (Westwood, 1874)	Woodland
Hesperiinae	
<i>Metisella orientalis</i> (Aurivillius, 1925)	Wetland
<i>Kedestes marshalli</i> * (Aurivillius, 1925)	Woodland
<i>Kedestes wallengrenii</i> (Trimen, 1883)	Woodland, rocky outcrops
<i>Teniorhinus harona</i> (Westwood, 1881)	Woodland
<i>Pardaleodes incerta</i> * (Snellen, 1872)	Forest
<i>Acada biseriata</i> (Mabille, 1893)	Woodland
<i>Acleros mackeenii</i> (Trimen, 1868)	Forest
<i>Semalea arela</i> (Mabille, 1891)	Forest
<i>Semalea pulvina</i> (Plötz, 1879)	Forest
<i>Andronymus caesar</i> (Fabricius, 1793)	Woodland
<i>Artitropa erinnys</i> (Trimen, 1862)	Forest, woodland
<i>Artitropa reducta</i> Aurivillius, 1925	Forest, woodland
<i>Platylesches galesa</i> (Hewitson, 1877)	Forest, woodland
<i>Zenonia anax</i> * (Evans, 1937)	Forest
<i>Zenonia zeno</i> (Trimen, 1864)	Forest
<i>Borbo detecta</i> (Trimen, 1893)	Woodland
<i>Borbo fatuellus</i> (Hopffer, 1855)	Forest, woodland
<i>Gegenes niso</i> (Linnaeus, 1764)	Ubiquitous
Papilionidae	
Papilioninae	
<i>Papilio dardanus</i> (Brown, 1776)	Forest, woodland
<i>Papilio demodocus</i> (Esper, 1798)	Ubiquitous
<i>Papilio desmondi</i> * (van Someren, 1939)	Forest
<i>Papilio echerioides</i> (Trimen, 1868)	Forest
<i>Papilio nireus</i> (Linnaeus, 1758)	Ubiquitous

<i>Papilio ophidicephalus</i> (Oberthür, 1878)	Forest
<i>Papilio pelodurus</i> * (Butler, 1896 ssp. nov.)	Forest
<i>Papilio phorcas</i> (Cramer, 1775)	Forest
<i>Graphium angolanus</i> (Goeze, 1779)	Ubiquitous
<i>Graphium polícenes</i> (Cramer, 1775)	Forest
Pieridae	
Coliadinae	
<i>Catopsilia florella</i> (Fabricius, 1775)	Ubiquitous
<i>Colias electo</i> (Linnaeus, 1763)	Open habitats
<i>Eurema (E.) brigitta</i> (Stoll, 1780)	Forest, woodland
<i>Eurema (E.) desjardinsii</i> (Boisduval, 1833)	Forest, woodland
<i>Eurema (E.) mandarinula</i> (Holland, 1892)	Forest, woodland
<i>Eurema (Terias) hapale</i> (Mabille, 1887)	Forest, woodland
<i>Eurema (T.) hecabe</i> (Linnaeus, 1758)	Forest, woodland
Pierinae	
<i>Nepheronia argia</i> (Fabricius, 1775)	Woodland
<i>Belenois aurota</i> (Fabricius, 1793)	Open habitats
<i>Belenois creona</i> (Cramer, 1775)	Open habitats
<i>Appias sylvia</i> *(Fabricius, 1775)	Forest
<i>Mylothris agathina</i> (Cramer, 1779)	Forest, woodland
<i>Mylothris rueppellii</i> (Koch, 1865)	Woodland
<i>Mylothris sagala</i> (Grose-Smith, 1886)	Forest
<i>Mylothris yulei</i> (Butler, 1897)	Forest
<i>Leptosia alcesta</i> (Stoll, 1780)	Forest
Nymphalidae	
Acraeini	
<i>Acraea acrita</i> (Hewitson, 1865)	Woodland
<i>Acraea aganice</i> (Hewitson, 1852)	Forest
<i>Acraea asema</i> (Hewitson, 1877)	Woodland
<i>Acraea egina</i> (Cramer, 1775)	Forest
<i>Acraea insignis</i> (Distant, 1880)	Forest
<i>Acraea natalica</i> (Boisduval, 1847)	Forest, woodland
<i>Acraea neobule</i> (Doubleday, 1848)	Woodland
<i>Acraea nohara</i> (Boisduval, 1847)	Open habitats
<i>Acraea oncaea</i> (Hopffer, 1855)	Woodland
<i>Acraea cabira</i> (Hopffer, 1855)	Forest, woodland
<i>Acraea encedon</i> (Linnaeus, 1758)	Woodland
<i>Acraea goetzei</i> * (Thurau, 1903)	Forest
<i>Acraea igola</i> (Trimen, 1889)	Forest
<i>Acraea johnstoni</i> (Godman, 1885)	Forest
<i>Acraea pentapolis</i> (Ward, 1871)	Forest
<i>Acraea perenna</i> * (Doubleday, 1847)	Forest
<i>Acraea serena</i> (Fabricius, 1775)	Woodland
<i>Acraea sotikensis</i> * (Sharpe, 1892)	Forest
<i>Acraea vumbui</i> (Stevenson, 1934)	Forest
Argynnini	
<i>Pardopsis punctatissima</i> (Boisduval, 1833)	Woodland
<i>Lachnoptera ayresii</i> (Trimen, 1879)	Forest
<i>Phalanta phalantha</i> (Drury, 1773)	Ubiquitous
<i>Issoria smaragdiferá</i> * (Butler, 1895)	Wetland
Danainae	
<i>Danaus chrysippus</i> (Linnaeus, 1758)	Ubiquitous
<i>Amauris niavius</i> (Linnaeus, 1758)	Forest

<i>Amauris albimaculata</i> (Butler, 1875)	Forest
<i>Amauris echeria</i> (Stoll, 1790)	Forest
<i>Amauris ochlea</i> (Boisduval, 1847)	Forest
Satyrinae	
<i>Gnophodes betsimena</i> (Boisduval, 1833)	Forest, woodland
<i>Melanitis leda</i> (Linnaeus, 1767)	forest, woodland
<i>Aphysoneura pigmentaria</i> (Karsch, 1894)	Forest
<i>Bicyclus anynana</i> (Butler, 1879)	Forest, woodland
<i>Bicyclus campinus</i> (Aurivillius, 1901)	Forest, woodland
<i>Bicyclus safitza</i> (Westwood, 1850)	Forest, woodland
<i>Bicyclus simulacris</i> * (Kielland, 1990)	Forest
<i>Heteropsis ubenica</i> * (Thurau, 1903)	Open habitats, woodland
<i>Ypthimomorpha itonia</i> (Hewitson, 1865)	Wetlands
<i>Neocoenyrus bioculata</i> *(Carcasson, 1964) ssp. nov.	Rocky outcrop
Nymphalinae	
<i>Hypolimnas anthedon</i> (Doubleday, 1845)	Forest, woodland
<i>Hypolimnas misippus</i> (Linnaeus, 1764)	Woodland
<i>Salamis parhassus</i> (Drury, 1782)	Forest
<i>Precis archesia</i> (Cramer, 1779)	Open habitats, woodland
<i>Precis octavia</i> (Cramer, 1777)	Forest, woodland
<i>Precis tugela</i> (Trimen, 1879)	Forest
<i>Junonia natalica</i> (Felder & Felder, 1860)	Woodland
<i>Junonia oenone</i> (Linnaeus, 1758)	Ubiquitous
<i>Junonia terea</i> (Drury, 1773)	Forest, woodland
<i>Vanessa cardui</i> (Linnaeus, 1758)	Ubiquitous
<i>Antanartia schaeeneia</i> * (Trimen, 1879)	Forest
Limenitidinae	
<i>Byblia ilithyia</i> (Drury, 1773)	Ubiquitous
<i>Neptidopsis ophione</i> (Cramer, 1777)	Forest
<i>Eurytela dryope</i> (Cramer, 1775)	Forest, woodland
<i>Eurytela hiarbas</i> (Drury, 1782)	Forest, woodland
<i>Sevenia boisduvali</i> (Wallengren, 1857)	Forest, woodland
<i>Sevenia moranti</i> (Trimen, 1881)	Forest
<i>Cyrestis camillus</i> (Drury, 1782)	Forest
<i>Neptis alta</i> (Overlaet, 1955)	Woodland
<i>Neptis laeta</i> (Overlaet, 1955)	Forest, woodland
<i>Neptis nina</i> * (Staudinger, 1896)	Forest
<i>Neptis saclava</i> (Boisduval, 1833)	Forest, woodland
<i>Neptis swynnertoni</i> (Trimen, 1912)	Forest
<i>Neptis trigonophora</i> (Butler, 1878)	Forest
<i>Cymothoe</i> * sp. nov.	Forest
<i>Pseudacraea boisduvali</i> (Doubleday, 1845)	Forest, woodland
<i>Pseudacraea deludens</i> * (Neave, 1912)	Forest
<i>Pseudacraea eurytus</i> (Linnaeus, 1758)	Forest
<i>Pseudacraea lucretia</i> (Cramer, 1775)	Forest, woodland
<i>Euptera kinugnana</i> (Grose-Smith, 1889)	Forest
<i>Euryphura achlys</i> (Hopffer, 1855)	Forest, woodland
<i>Euryphura concordia</i> (Hopffer, 1855)	Woodland
<i>Euphaedra neophron</i> (Hopffer, 1855)	Forest
<i>Bebearia orientis</i> (Karsch, 1895)	Forest
<i>Hamanumida daedalus</i> (Fabricius, 1775)	Open habitats,

<i>Aterica galene</i> (Brown, 1776)	forest, woodland
<i>Pseudargynnis hegemone</i> (Godart, 1819)	Forest
Charaxinae	Wetland
<i>Charaxes achaemenes</i> (C.& R.Felder, 1867)	Woodland
<i>Charaxes acuminatus</i> (Thurau, 1903)	Forest
<i>Charaxes bohemani</i> (C.& R.Felder, 1859)	Woodland
<i>Charaxes brutus</i> (Cramer, 1779)	Forest, woodland
<i>Charaxes candiope</i> (Godart, 1824)	Ubiquitous
<i>Charaxes castor</i> (Cramer, 1775)	Open habitats, woodland
<i>Charaxes cithaeron</i> (C.& R.Felder, 1859)	Forest, woodland
<i>Charaxes dilutus</i> * (Rothschild, 1898)	Forest
<i>Charaxes druceanus</i> (Butler, 1869)	Forest, woodland
<i>Charaxes ethalion</i> (Boisduval, 1847)	Woodland
<i>Charaxes fionae</i> (Henning, 1977)	Woodland
<i>Charaxes guderiana</i> (Dewitz, 1879)	Woodland
<i>Charaxes jasius</i> (Linnaeus, 1767)	Woodland
<i>Charaxes macclounii</i> (Butler, 1895)	Forest, woodland
<i>Charaxes margaretae</i> * (Rydon, 1980)	Forest
<i>Charaxes pollux</i> (Cramer, 1775)	Forest
<i>Charaxes protoclea</i> (Feisthamel, 1850)	Forest, woodland
<i>Charaxes varanes</i> (Cramer, 1777)	Ubiquitous
<i>Charaxes violetta</i> (Grose-Smith, 1885)	Forest
<i>Charaxes wakefieldi</i> (Ward, 1871)	Forest, woodland
<i>Charaxes xiphares</i> * (Stoll, 1781)	Forest
Libytheinae	
<i>Libythea labdaca</i> (Westwood, 1851)	Forest
Lycaenidae	
Lipteninae	
<i>Alaena amazoula</i> (Boisduval, 1847)	Rocky outcrop
<i>Alaena picata</i> * (Sharpe, 1896)	Rocky outcrop
<i>Pentila pauli</i> * (Staudinger, 1888)	Forest, woodland
<i>Pentila tropicalis</i> (Boisduval, 1847)	Forest
<i>Ornipholidotos peucetia</i> (Hewitson, 1866)	Forest, woodland
<i>Teriomima puella</i> (Kirby, 1887)	Forest, woodland
<i>Teriomima williami</i> (Henning & Henning, 2004)**	Forest
<i>Baliochila neavei</i> (Stempffer & Bennett, 1953)	?Forest
<i>Baliochila woodi</i> * (Riley, 1943) ssp. nov.	Forest
<i>Baliochila</i> * sp. nov.	Forest
Miletinae	
<i>Spalgis lemolea</i> (Druce, 1890)	Forest, woodland
<i>Lachnocnema emperamus</i> (Snellen, 1872)	Woodland
<i>Lachnocnema</i> sp.	Forest
<i>Lachnocnema</i> sp.	Forest
Theclinae	
<i>Myrina silenus</i> (Fabricius, 1775)	Forest, woodland
<i>Cigaritis mozambica</i> (Bertoloni, 1850)	Open habitats
<i>Cigaritis nyassae</i> (Butler, 1884)	Woodland
<i>Axiocerses bamptoni</i> * (Henning & Henning, 1996)	Forest
<i>Epamera sidus</i> (Trimen, 1864)	Forest
<i>Epamera</i> * sp. nov.	Forest
<i>Argiolaus silarus</i> (Druce, 1885)	Forest, woodland

<i>Hypolycaena buxtoni</i> (Hewitson, 1874)	Forest, woodland
<i>Leptomyrina hirundo</i> (Wallengren, 1857)	Rocky outcrop
<i>Leptomyrina (Gonatomyrina)*</i> sp. nov.	Rocky outcrop
<i>Pilodeudorix caerulea</i> (Druce, 1890)	Open habitats, woodland
<i>Pilodeudorix jacksoni*</i> (Talbot, 1935)	Forest, woodland
<i>Virachola</i> nr. <i>Vansomereni*</i> (Stempffer, 1951)	Forest
<i>Capys disjunctus*</i> (Trimen, 1895)	Open habitats
Polyommatainae	
<i>Anthene livida</i> (Trimen, 1881)	Rocky outcrop
<i>Anthene crawshayi*</i> (Butler, 1899)	Open habitats, woodland
<i>Anthene larydas</i> (Cramer, 1780)	Forest, woodland
<i>Cupidopsis cissus</i> (Godart, [1824])	Ubiquitous
<i>Pseudonacaduba sichela</i> (Wallengren, 1857)	Ubiquitous
<i>Uranotauma antinorii</i> (Oberthür, 1883)	Forest
<i>Uranotauma falckensteini*</i> (Dewitz, 1879)	Forest
<i>Uranotauma nubifer</i> (Trimen, 1895)	Open habitats, forest
<i>Cacyreus lingeus</i> (Stoll, 1782)	Ubiquitous
<i>Cacyreus fracta</i> (Grünberg, 1911)	Ubiquitous
<i>Cacyreus virilis</i> (Aurivillius, 1924)	Ubiquitous
<i>Leptotes brevidentatus*</i> (Tite, 1958)	Woodland
<i>Leptotes pirithous*</i> (Linnaeus, 1767)	Ubiquitous
<i>Leptotes pulchra</i> (Murray, 1874)	Woodland
<i>Tuxentius melaena</i> (Trimen, 1887)	Woodland
<i>Zizeeria knysna</i> (Trimen, 1862)	Ubiquitous
<i>Actizera lucida</i> (Trimen, 1883)	Open habitats
<i>Azanus mirza</i> (Plötz, 1880)	Ubiquitous
<i>Euchrysops malathana</i> (Boisduval, 1833)	Open habitats
<i>Euchrysops osiris</i> (Hopffer, 1855)	Woodland
<i>Thermoniphas micylus</i> (Cramer, 1780)	Forest
<i>Oboronia bueronica</i> (Karsch, 1895)	Forest
<i>Oboronia guessfeldtii</i> (Dewitz, 1879)	Forest

* New to Mozambique

**Reinstatement (Collins et al., unpubl. data).