BIODIVERSITY KNOWLEDGE FROM THE CHIMANIMANI TRANS-FRONTIER CONSERVATION AREA (TFCA)

Jonathan Timberlake, July 2017

1. INTRODUCTION

The Chimanimani Trans-Frontier Conservation Area (TFCA), lying on the border of Eastern Zimbabwe and central Mozambique at around 19°50'S, 33°04'E, has long been known by biologists as an area of exceptional biodiversity with a number of plant species that are not found elsewhere (known as endemics). Covering around 4100 km^2, the TFCA comprises a montane massif rising from a forested lowland area and has an altitudinal range from 140 m along the Rio Mussapa to the peak of Mt Binga at 2436 m on the international border. One of the main causes of the high levels of plant endemism is that much of the massif consists of hard, resistant quartzite rocks that give rise to rugged scenery and very nutrient-poor soils.

Over the last 60 years much has been written on the biodiversity of both the mountains and the associated forested lowlands, particularly for the Zimbabwe side. But with the exception of the comprehensive paper on the plant ecology by Phipps and Goodier in 1962, and a detailed account of the Mozambique side by Dutton and Dutton in 1975, until recently much of this information remained scattered. However, recent project reports have brought together much of what we know on the botany of the mountains and of the lowland forests (Timberlake *et al.* 2016a, 2016b), but not on the vertebrates and invertebrates.

As part of a Critical Ecosystem Partnership Fund (CEPF)-funded project to assist management of the TFCA on both sides of the international border, the Micaia Foundation (a Mozambican NGO) commissioned a consultancy to compile existing biodiversity information on the TFCA and to assess that information to determine what the significant gaps, especially for management actions, are. In addition, the consultant was to provide a bibliography (see Annex 1), with scanned copies where possible, of published information for a proposed Chimanimani Resource Centre. This report and annexes are the result.

The report outlines the main biodiversity information available and the sources. It is divided into sections on vegetation, plant species, various vertebrate groups and invertebrates. Our main knowledge is outlined, i.e. what we know and what we do not know, followed by some recommendations on the major gaps from the point of view of TFCA management that would need to be addressed or filled.

2. GENERAL DESCRIPTION

Full details on the geology, geomorphology, climate and land use history of the TFCA area are available in Phipps & Goodier (1962), Dutton & Dutton (1975), the Chimanimani TFCA Management Plan (Ghiurghi, Dondeyne & Bannerman 2010) and in reports arising from the recent Darwin Initiative and CEPF projects (Timberlake *et al.* 2016a & 2016b, respectively). They are not repeated in detail here.

In brief, the TFCA covers 4091 km^2 with 815 km^2 of that in a Core Zone where no settlement is permitted. The whole TFCA ranges in altitude from 140–350 m on the forested footslopes

and pediments on the eastern Mozambican side along the Rio Mussapa and in the far south at the Haroni-Rusitu junction area in Zimbabwe, to a montane massif rising to over 2000 m. The main montane plateau, extending over 530 km^2 and which is heavily dissected particularly in the south, lies at around 1000–1800 m with over 70% of it in Mozambique and a smaller portion in Zimbabwe. The Core Zone is formally protected as the Chimanimani National Park in Zimbabwe and the Chimanimani National Reserve in Mozambique. The Buffer Zone in Mozambique (it does not seem to be present in Zimbabwe) where settlement and agriculture are allowed covers 1721 km^2.

Rainfall is high in the mountains, possibly up to 3000 mm/year in the wettest places, and is probably around 1500 mm/year in the forested lowland areas in Mozambique. The commercial farmland and forestry plantations in Zimbabwe, which lie in a rain-shadow, have a rainfall of around 1100–1400 mm/year.

Conservation threats in the Zimbabwe part of the Core Zone are minimal, whilst in the Core Zone in Mozambique a massive influx of artisanal gold-panners, who have been digging out many of the stream beds and stream banks over the last 12 years, have led to much concern by conservationists. In the Buffer Zone in Mozambique there has been a rapid expansion of forest clearance for subsistence agriculture over the last 25 years, accompanied by greatly increased settlement and an increased incidence of wildfires. The effects of increased fire incidence in the montane areas are not clear, but this is certainly having a deleterious effect of the lowland vegetation. The other conservation threat is the rapid spread of the invasive shrub *Vernonanthura phosphorica*, first introduced as a bee-fodder plant by an NGO some 20 years ago. This is now taking over where lowland forest and woodland has been cleared and burnt; it has also been found in montane areas above 1000 m altitude.

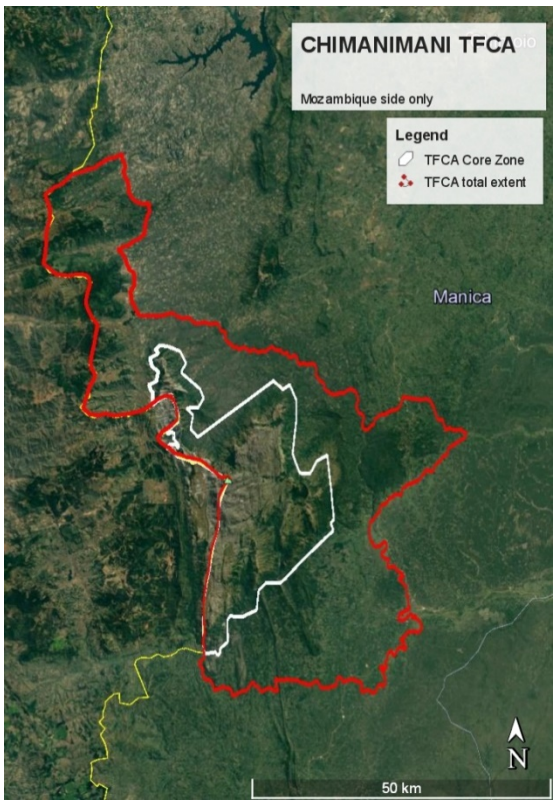

Figure 1. Extent of TFCA in Mozambique. Core Zone shown in white.

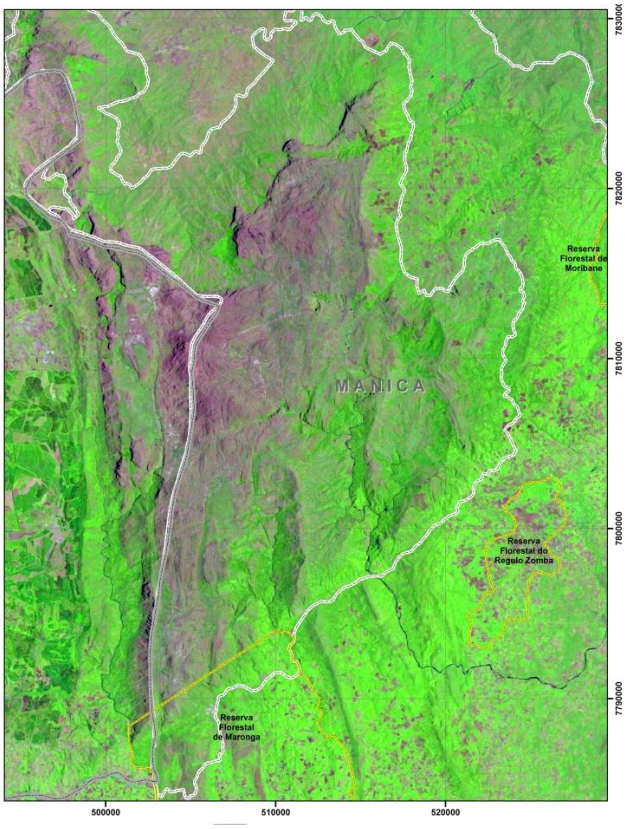

Figure 2. Vegetation cover over the Chimanimani TFCA showing the larger montane extent in Mozambique.

The main detailed study on the vegetation of the TFCA, although only of the Zimbabwe side, is the vegetation map by Goodier and Phipps (1962) along with detailed vegetation descriptions found in their plant ecological study (Phipps & Goodier 1962). In these they describe 12 vegetation types from the area above 1000 m altitude and map 10 of them, listing the main defining species and the soil properties. These types were simplified somewhat in Timberlake *et al.* (2016b) and the descriptions extended to the Mozambique side (see Annex 2).

However, there are earlier accounts of the vegetation of the broader area in Gomes Pedro and Barbosa (1955), in the vegetation map of the whole Flora Zambesiaca area (Wild & Barbosa 1968) and in the vegetation map of Africa by Frank White (White 1983). Gomes Pedro & Barbosa (1955) show the montane vegetation of the Mozambique side as Zona subalpestre (Complexo 39, with evergreen forest, secondary scrub, drier *Widdringtonia* forest, Ericaceous scrub and secondary grassland, amongst others) surrounded by Zona do médio Búzi (Complexo 30, with various types of mixed and open woodland, but surprisingly not mentioning any *Brachystegia* species or *Uapaca*). The Flora Zambesiaca map (Wild & Barbosa 1968) is more detailed showing the montane area on both sides of the border as *Themeda–Exotheca–Loudetia* submontane and montane grassland (Unit 68) with moist evergreen forest on the lower eastern slopes (unit 1 with *Maranthes goetzeniana*, *Khaya anthotheca* and *Erythrophleum guineense*) and high rainfall *Brachystegia spiciformis* woodland adjacent (unit 21) on the Mozambique side and *Brachystegia spiciformis–Julbernardia globiflora* woodland (unit 23) on the Zimbabwe side. The Africa-wide map by White (1983) depicts this more simply with Undifferentiated Afromontane vegetation (grassland and forest, unit 19a) in the montane areas surrounded by Drier Zambezian miombo woodland (unit 26) on both the Zimbabwe and Mozambique sides. The lowland forests are not shown. In an earlier study of montane vegetation, White (1978) also mentions an Ericaceous vegetation belt on the Chimanimanis, similar to that found in Malawi and Nyanga.

Also at this time, a vegetation map was produced by Crook (1956) of the Melsetter (now Chimanimani District) Intensive Conservation Area in Zimbabwe (essentially the commercial farming areas). Four types were described covering Closed Evergreen Forest, Short Open Grassland, Bracken Scrub and two types of Woodland (dense and open).

Much less, however, has been written on the vegetation of the Mozambique side, although Timberlake *et al.* (2016a) give a broad description of the forests, swamps and grasslands of the lowland areas near the Rio Mussapa.

The moist forests of the Chimanimani area on the Zimbabwe side are described in detail by Müller (1999, 2006), including both higher altitude Afromontane forests and the low altitude forests of the Rusitu Valley in Zimbabwe. Although the descriptions of the far more extensive lowland forests on the Mozambique side are less detailed, accounts and species lists can be found in Müller, Sitoe & Mabunda (2005) and in Monteiro *et al.* (2011), as well as in an unpublished chapter in the Visitor's Guide to the Lower Rustiu Valley (BFA 2000).

A systematic vegetation survey covering both montane and lowland vegetation, as well as the intervening woodland, is not available. Such a vegetation or habitat survey should be carried out in moderate detail, cover both sides of the border equally, and should be an essential first step in designating conservation management zones. However there are difficulties as a number of important vegetation types, such as rock outcrops or riparian forest strips, are so small that they would not feature on any but a very detailed map of the area. This could be overcome using an appropriate legend.

4. PLANT SPECIES

Flowering plants and ferns are perhaps the best recorded and collected group from the Chimanimani Mountains, especially those for the montane areas above 1200 m altitude. A comprehensive account of the botany of the mountains synthesising most of the available information on collecting history, endemics, phytogeography and plant conservation can be found in Timberlake *et al.* (2016b). Other important sources of information are Phipps and Goodier (1962) on plant ecology and Wild (1964) on the endemics, while Goodier and Phipps (1961) and Wursten, Timberlake and Darbyshire (2017, in press) provide plant checklists of the upper parts of the TFCA, Timberlake *et al.* (2016a) gives a list of plants associated with the low altitude forests in Mozambique, and there is an unpublished checklist from the forests and woodlands of the Lower Rusitu valley in Zimbabwe (Timberlake 1999).

No plant checklist for the whole TFCA is available, but the updated montane list mentioned above (Wursten *et al.* 2017) is now being published. Owing to its pre-publication status and length it is not given as an Annex here. It lists 977 species (945 of them native) with 71 of them only known from the Chimanimani Mountains above 1200 m, an endemism level of 7.4% which must be one of the highest for any areas in southern Africa outside of the fynbos biome in the Cape in South Africa. However, the total number of endemic plant species from the whole TFCA (both montane and lowland), that is species that are globally not found elsewhere, is around 87 (see Annex 4).

In the montane areas there appears to be no apparent difference in plant species composition between the Mozambique and Zimbabwe sides of the mountains, even though the smaller Zimbabwe side lies in a rainshadow with a possibly lower rainfall. The habitats of particular interest seem to be equally represented on both sides of the international border.

The checklist prepared for the unpublished Visitor's Guide to the Lower Rusitu Valley (Timberlake 1999 in BFA 2000), a relatively small part of Zimbabwe and immediately adjacent parts of Maronga in Mozambique at around 350–800 m altitude, lists 784 species of flowering plants and ferns (Annex 3). However, the altitudinal range of this compiled checklist is not clear as it seems to include some montane endemics otherwise only known from above 1000 m. The list of plants recently collected from the lowland forests, woodlands, grassland and swamps of Maronga, Zomba, Mpunga and Mahate communities (Timberlake *et al.* 2016a) contains 532 species, but disturbed areas and woodlands were not well covered.

The study by Timberlake *et al.* (2016b) showed that there are four types of plant endemics in the TFCA: (a) those confined to the mountains proper, nearly all of them on quartzite rocks or soils and primarily found above 800–1000 m, (b) those species primarily found in lowland forests and grasslands below 600 m, (c) those species only known from adjacent areas on Umkondo sandstone substrates in Zimbabwe just outside the present TFCA, and (d) near-endemics that are known from both the main Chimanimani Mountains and adjacent non-quartzite hills such as Banti, Tsetserra and Rotanda (Table 1). A full list of all these endemics is given in Annex 4. It is important to recognize that the extent of the montane quartzite substrate, to which most of the endemics are confined, is only around 530 km^2. A number of other plants of restricted distribution found in the Chimanimanis, but also found on other mountains further away such as the Vumba, Nyanga, Gorongosa and Serra Choa, are termed Manica Highland endemics.

Recently, 66 species of restricted distribution have been assessed for their threat status using the IUCN Red List criteria. Of these just less than half (27) were considered to fall into a

threat category (Table 2), mostly as the conservations status for plants in the Core Zone was considered good. The small-scale (and illegal) gold-panning activity there is not a threat to plants in most cases, although aquatic vertebrates and invertebrates are probably significantly affected.

Table 1. Number of endemic or near-endemic taxa in the Chimanimani area.

Category	**no. taxa**
Chimanimani montane endemic	71
Chimanimani montane near-endemic	20
Endemic to Umkondo sandstone areas around Chimanimani Mts	7
Chimanimani foothills endemic	9
Chimanimani foothills near-endemic	1

Table 2. Conservation assessments of Chimanimani endemics and near-endemics (updated from Timberlake *et al.* 2016b).

IUCN Conservation category	**no. taxa**
CR	1 (B2)
EN	5 (B1+B2)
VU	21 (B1+B2 & D2)
NT	1
LC	34
DD	4
not assessed	33
TOTAL	99

As mentioned above, what is missing for plants is a comprehensive checklist for the whole TFCA. The areas at present inadequately covered are the lowland forests, grasslands and swamps, and particularly the miombo and similar woodlands at mid-altitude (400–1000 m). The population status of many of the restricted-range and endemic species is also inadequately known – knowledge on which would greatly help the Park/Reserve authorities better target conservation activities.

5. VERTEBRATES

Compared to plants and vegetation, much less has been written about the vertebrate and invertebrate wildlife of the mountains. The main published work on wildlife on the Mozambique side of the Chimanimani TFCA is that by Paul and Elizabeth Dutton (Dutton & Dutton 1975). In appendices they provide checklists of mammals (including rodents and bats) compiled by Reay Smithers and José Lobão Tello from museum collections and survey work; birds, based on a list by Hodgson (1971) with supplementary information from Desmond Jackson (1973); a list of reptiles and amphibians from Don Broadley; and a list of freshwater fish compiled by Graham Bell-Cross from museum collections. These checklists apparently cover the whole Chimanimani area in both Zimbabwe and Mozambique and both montane habitats and lowland forest, effectively the whole TFCA. A list of just montane species would probably be significantly shorter.

The various groups are discussed in more detail below.

5.1 Mammals

In the recent past the extensive grasslands and open areas of the Chimanimani Mountains were renowned for large herds of Eland and Sable antelope. Owing to hunting by the small-scale miners since the mid-2000s these have now mostly disappeared. Phipps and Goodier (1962) mention Klipspringer, Eland and Sable antelope as being the main grazers, with baboons and Rock Hyrax also common. Large mammals used to roam freely across the border but, according to the Reserve Warden (pers. comm. Nov 2014), the remaining animals have now moved to more wooded areas at slightly lower altitudes in the east and north east where there are fewer people. During many weeks of fieldwork in 2014 and 2016, almost no antelope were seen, although some evidence of small carnivores was noted. A species of particular interest is the Aardvark or Ant bear (*Orycteropus afer*), the dug holes of which provide an unusual habitat across the grasslands, one that is often used by Blue Swallows for their nests. Numerous Aardvark holes were seen during our survey, but it was not checked if these were still occupied, either by Aardvarks or Blue Swallows. Surprisingly, the Aardvaak does not appear on either of the two mammal checklists.

An appendix in Dutton & Dutton (1975) provides a checklist with 67 mammals (including rodents and bats) compiled by Reay Smithers and José Lobão Tello from museum collections and survey work (Annex 5). Much of this probably later appeared in the atlas of Mozambique mammals (Smithers & Tello 1976). It is not clear if this list covers the whole Chimanimani area and both montane and lowland forest habitats, effectively the whole TFCA, as it states "existentes nas montanhas de Chimanimani e áreas adjacentes….", but this is probably the case; a list of species only recorded from upland areas would be significantly shorter.

Dutton & Dutton (1975) provide quite a bit of detail on populations and distribution of larger mammals obtained during their 1972 survey, both carnivores and herbivores. Part of the survey was done using aerial reconnaissance, and they include a map (Mapa 1) showing the distribution of ungulates, indicating that elephant and buffalo were only recorded from the lowland forests. A total of 14 large mammal species were noted by them during the aerial survey. Some species that had been historically present were not seen, such as lion (last recorded in the 1950s), rhinoceros, hippopotamus, zebra and Lichtenstein's Hartebeest. Such species would now appear to be locally extinct.

A shorter list of 52 mammals recorded from the Lower Rusitu Valley in Zimbabwe is given in Annex 6, including a fruit bat discovered a long way south of its previously known distribution (Cotterill 1995). This list was compiled by Fenton Cotterill from sight records from the area along with specimens from the Natural History Museum in Bulawayo, and was to have formed part of the unpublished Visitor's Guide (BFA 2000, unpublished). The nomenclature of the two lists given here differs in some regards, but no attempt has been made to harmonise them.

5.2 Birds

Apart from plants, there is more information available on the birds of the Chimanimani area than for any other group. Even so, it is not as comprehensive as might have been expected with differing levels of detail across the area. The montane area and the lowland forest are generally covered by different studies.

The first study on birds is perhaps that by Swynnerton, who when living at Chirinda Forest in Zimbabwe travelled through much of the wider Gazaland area on both sides of the international border. He also collected a number of plant specimens from Mt Pene in

Zimbabwe, now on Forestry Commission land just outside the present TFCA. Two papers were published on the birds of the area and their habitats (Swynnerton 1907, 1908).

A list of 180 bird species found above 600 m altitude in the montane portion on both sides of the border is given in Dutton & Dutton (1975) based on Hodgson (1971), and was based on Hodgson's own observations from 1963 to 1967 coupled with earlier records in Swynnerton (1907, 1908) and Masterson & Child (1959) (Annex 7). The forest avifauna is said to be of particular interest. This was superseded by a comprehensive and well-annotated checklist by Beasley (1995) covering 185 species from the c.500 km^2 area above 700 m in both Mozambique and Zimbabwe, including many of his own observations from 1971 to 1989 as well as those from Jackson (Jackson 1973a, 1973b, 1975) and records in Irwin (1981) (Annex 8). The numerous notes indicate localities of occurrence, status and habitat. Although there are undoubtedly some more recent additions to this list, it probably reflects well the upland avifauna. It does not attempt to list species found lower down, which would have greatly increased the total number.

A montane species of particular conservation interest is the Blue Swallow *Hirundo atrocaerulea*, generally found in montane grassland (Little 2013). This species often uses Aardvark (*Orycteropus afer*) burrows for its nests. Although numerous Aardvark holes were seen during recent visits, it was not clear if these are occupied, either by Aardvarks or Blue Swallows. A recent survey of Blue Swallows covering Malawi and Mozambique (Little 2013) did not visit the Chimanimani area, but seemed to suggest that the species would not be found there owing to disturbance. However, the species is present on the Zimbabwe side (Childes & Mundy 2001) and there is an historic record from Mozambique given in Parker (2005).

Lowland forests in the Lower Rusitu Valley have been very well documented (Vernon *et al.* 1990, Sue Childes & Michael Irwin in BFA 2000). It is said to be the only place in Zimbabwe where highland, mid-altitude and lowland avifaunas meet and form an ecological continuum. The first ornithological trip to this area was apparently by R.W. Rawline in 1955, followed by a number of others in the 1960-70s resulting in unpublished annotated lists. At that stage, the area was difficult of access on the Zimbabwe side and something of a new frontier. The first published account was by Macdonald, Dean & Vernon (1974), followed later by Vernon, Macdonald & Dean (1989, 1990) which lists 233 species. At that time a number of species were said to be only found in Zimbabwe in this area, such as Vanga Flycatcher, Slender Bulbul, Angola Pitta, Barred Long-tailed Cuckoo, Lesser Cuckoo, Chestnut-fronted Helmetshrike, Delegourge's Pigeon, Green Coucal and Eastern Lesser Honeyguide, although they are often more common in lowland areas of Mozambique further north. In their 1989 publication, Vernon *et al.* list 72 species of forest bird from this area (49 of which were true forest species), which they said represents perhaps the richest forest avifauna in southern Africa. In comparison, only 66 strictly forest species were listed for the more extensive and attitudinally more diverse Gorongosa Mountain (Oatley & Tinley 1989). Half of the forest birds are resident while others show seasonal movement from the montane forests at higher altitudes during the cold season, showing that forest bird populations are neither stable nor aseasonal, contrary to the accepted wisdom at the time. Changes in annual rainfall are said to lead to changes in breeding numbers.

The Makurupini forest, at the southern end of the Chimanimani National Park in Zimbabwe, was said (Vernon *et al.* 1989) to be a mosaic of primary and secondary forest, felled in portions for subsistence cultivation in the past but regenerated, while the Vimba forest (Rusitu Botanic Reserve) was almost entirely secondary. More species and individuals of birds were found in secondary than in primary forest.

Peter Mundy (in Childes & Irwin, in BFA 2000) provides a checklist of 262 species from the Lower Rusitu Valley in Zimbabwe, along with an indication of habitat and status (Annex 9). Of these, 52 are said to be forest species and 35 are forest edge or thicket species. One species is Endangered (Taita Falcon), six are Vulnerable (four of them raptors) and eight near-threatened.

In the broader Chimanimani area three Important Bird Areas (IBAs) have been designated, two on the Zimbabwe side (Childes & Mundy 1998, 2001, ZW006, ZW007) and a much larger one in Mozambique (Parker 2001, MZ006). The Chimanimani area lies within an Endemic Bird Area (Stattersfield *et al.* 1998), the so-called Eastern Zimbabwe Mountains EBA, with four biome-restricted species being found in one or other of the IBAs – Southern Banded Snake-eagle *Circaetus fasciolatus*, Swynnerton's Robin *Swynnertonia swynnertoni*, Blue Swallow *Hirundo atrocaerulea* and Blue-backed (or Plain-backed) Sunbird *Anthreptes reichenowi*.

Of the 186 bird species said to be found in the Chimanimani Mountains IBA (ZW006), there are three species of global conservation concern – Southern Banded Snake-eagle (NT), Taita Falcon *Falco fasciinucha* (VU) and Blue Swallow (NT) – along with two restricted-range species. Species typical of three separate biomes (Afrotropical Highlands, East African Coast and Zambezian) are listed, with two species found only in the Eastern Zimbabwe Mountains EBA – the Chirinda Apalis *Apalis chirindensis* and the Briar Warbler *Prinia robertsii*. In the Haroni–Rusitu junction and Botanic Reserves IBA (ZW007), 233 species are recorded, coming again from the three separate biomes. Key species are the Southern Banded Snake-eagle, Taita Falcon and Blue-backed Sunbird.

In the Mozambique IBA (MZ006), covering around 1740 km^2 and ranging from 500–2436 m, three restricted-range bird species occur – Swynnerton's Robin (VU), Chirinda Apalis and the Briar Warbler. The Southern Banded Snake-eagle (NT) and Blue-backed Sunbird are species of conservation concern and residents of lowland forest, while Swynnerton's Robin (VU) is found in montane forest and Blue Swallow (NT) in montane grassland. The Taita Flacon (VU) is probably regular but has only been recorded once. This IBA is said to probably be the area of greatest avian diversity in Mozambique as it is at the intersection of three biomes and has such a large altitudinal and habitat range. However, a catastrophic fire in 1994 greatly affected the lowland forests.

As mentioned above, our knowledge on birds is fairly comprehensive but each of the two main checklists covers only part of the area – firstly, that above 700 m and secondly, only the Zimbabwe portion of the lowland forest area (upper altitudinal limit unspecified). Thus the major gap in our ornithological knowledge is from the forested and woodland areas on the Mozambique foothills and pediments. Good information is available from Zimbabwe but this is not mirrored on the Mozambique side, where extensive fieldwork would be required.

Given the proximity of the two areas and the ability of many species to migrate altitudinally through the seasons, a comprehensive annotated checklist covering the complete Chimanimani TFCA needs to be produced. This should be annotated in a similar way to Beasley (1995), including distribution, habitat preference, relative abundance and conservation status. A major consideration here is that any ecotourism initiatives are likely to largely depend on birds and birders.

5.3 Reptiles & Amphibians

Nearly all the studies and lists of reptiles and amphibians (collectively known as herps) have come from the Zimbabwe side of the Chimanimani Mountains and from the low altitude Haroni-Rusitu area. Most of these date from the 1970s and were compiled by Don Broadley, who was initially at the Mutare (Umtali) Museum and later at the Natural History Museum in Bulawayo, Zimbabwe. Most of the voucher specimens are lodged in Bulawayo.

Broadley compiled a checklist for the Dutton's survey (Dutton & Dutton 1975) based on earlier records, nearly all of which would have been recorded from the Zimbabwe side of the massif, probably above 1000 m altitude. This list, which includes Portuguese common names, gives 62 reptiles and 34 amphibians (Annex 10, nomenclature corrected by Werner Conradie), including large crocodiles reported from the Rio Mufomodzi below the Mutsarara waterfall (Martin's Falls). The crocodiles may not be found there now. Two amphibians were of particular note – *Bufo vertebralis grindleyi* and *Arthrolepis troglodytes* – both said to be endemic to the mountains. However, the *Bufo* species has been lumped under a much more widely distributed species, *Poyntonophrynus fenoulheti* (https://fr.wikipedia.org/wiki/Poyntonophrynus_fenoulheti), so now cannot be considered endemic. The other endemic amphibian, the Cave Squeaker frog *Arthroleptis troglodytes*, was first found by Don Broadley in a cave near the Bundi Plain at 1675 m in the western Chimanimanis, and had not been found since 1962 (ZSL 2016). Its conservation status was assessed as Critically Endangered on the IUCN Red List (http://www.iucnredlist.org/details/54389/0, accessed April 2017), and it was considered possibly extinct as no individuals were found despite intensive searching by specialists in the type locality in 2010 (Harvey *et al.* 2010). However, in November 2016 scientists from the Natural History Museum of Zimbabwe in Bulawayo announced they had located and captured four specimens, the first such occurrence since 1962 (https://www.nytimes.com/2017/02/04/world/africa/zimbabwe-frog-cave-squeaker.html?ref=world&_r=0). The new specimens were found under leaf litter, rather than the sinkhole or cave habitats that had been assumed.

Robert Hopkins (Natural History Museum, Bulawayo) has collected frogs from the Zimbabwe side of the mountains since 2007 and has found nearly all those listed in Broadley's earlier list (Annex 11) plus *Hemisus marmoratus* (Mottled or Marbled-shovel snouted frog). He also has specimens of many amphibians and some reptiles available for DNA analysis. Hopkins mentions (pers. comm., April 2017) that some specialists have suggested that the Berg Adder (*Bitis atropos*) commonly found in the mountains may be a new subspecies or species.

As part of the planned Visitor's Guide to the Lower Rusitu Valley of Zimbabwe (BFA 2000), which was unfortunately never completed or published, a brief chapter and checklist was written by Don Broadley on the herps of the lowland Haroni-Rusitu area in Zimbabwe, which would effectively cover the forested and wooded lowland Chimanimani footslopes in Maronga and Zomba. This list (Annex 11) contains 40 reptile and 26 amphibian species, with one considered endemic to the area – the Flat-lizard *Platysaurus ocellatus*. There are also six reptile and three amphibian species with very restricted ranges in Zimbabwe, although they are probably to be found more widely in suitable habitat in lowland Mozambique. Particular species of interest are an amphisbaenian – Swynnerton's Worm-lizard *Chirindia swynnertonii* – which is only known from here in Zimbabwe although it is more widespread in Mozambique, and the large Gaboon Viper *Bitis gabonica*.

The herpetofauna of the Chimanimani area is quite diverse, with a good representation of amphibians. The levels of endemism – one lizard and one frog – are moderately high for its size. As with the other animal groups, the richness and importance of the lower Rusitu valley

in Zimbabwe is primarily because its lowland moist forest habitat is very scarce in that country but much more widespread in Mozambique.

Although some herp collecting trips have been made to the Chimanimani Mountains since the 1970s, no further lists appear to have been published (Werner Conradie, pers. comm. 2017). Much is already known, but there are some significant gaps. A comprehensive list from all habitats from mountain peaks to forested lowlands is needed. This could be done primarily through compilation, although (as with birds) the main gap in coverage is probably the forested footslopes and woodlands on the Mozambique side.

5.4 Fish

The first published study on the fish of the Chimanimani area was by Graham Bell-Cross of the Queen Victoria Museum (now National Museums of Zimbabwe in Harare), which lists 49 species (Bell-Cross 1973, and Apendice F in Dutton & Dutton 1975 – see Annex 12). This list was from the main Busi catchment including the Bundi, Haroni, Rusitu/Lucite and Mussapa rivers in both countries. A species of Grunter, *Chrysichthys hildae*, from the Busi was described as new, and the study also pointed out the danger of introducing alien fish species such as trout (*Oncorhynchus mylissi* and *Salmo trutta*) in the upper reaches.

A much shorter account was written for the Lower Rusitu Valley Visitor's Guide (J.L. Minshull & B. Marshall in BFA 2000, unpublished) which listed 14 species recorded in the 1950s to 1970s from this part of Zimbabwe, three of which are more typical of mountain waters. This list is incorporated in an updated version of Bell-Cross one (Annex 13). In their account it was suggested that in the whole Busi River system (i.e. below the Lucite and Mussapa, as well as above) 50–60 fish species are likely to be found.

A new species of tilapia, *Chetia brevicauda*, was discovered near Dombe, lower down the Rio Lucite in 1997 (Bills & Weyl 2002).

More recently, Roger Bills (SAIAB, Grahamstown, South Africa) produced a comprehensive list based on a field survey in the Chimanimani TFCA and Busi River area in September/October 2002, which gives 63 species, although the list has not yet been published. He suggests that the region is of great interest with potentially undescribed species in several families.

Much data on the fishes of the Busi catchment has already been gathered, but there is perhaps less from the upper montane reaches. It is these areas that have been badly affected by damage to streams from artisanal gold-panning, as well as the greatly increased siltation arising from gold mining on the lower reaches, particularly along the Haroni River in Zimbabwe. What is now needed is the compilation of a comprehensive checklist, indicating altitude and habitats where each species are found. Many specimens and records are available, particularly in Bulawayo (NHMZ) and Grahamstown (SAIAB), but have not yet been systematically brought together.

6. INVERTEBRATES

Although there are many more invertebrate species than vertebrates or plants, unsurprisingly little has been recorded on them for the Chimanimani area.

The Dutton's Chimanimani Mountains study (Dutton & Dutton 1975) does not mention invertebrates at all, but the unpublished Visitor's Guide to the Lower Rusitu Valley (BFA 2000) contains two short chapters on them – one on butterflies by Alan Gardiner and one on other insects and arthropods by Moira Fitzpatrick.

6.1 Butterflies

Lepidoptera, especially butterflies, are generally fairly well recorded in Zimbabwe, although surprisingly no list appears to be available for the montane areas (Alan Gardiner and Colin Congdon, both pers. comm. October 2016).

Despite the large number of endemic plants, some of which appear to be suitable larval food species, there is just one species of butterfly known to be endemic to the Chimanimani Mountains – *Lepidochrysops barnesii* (Lycaenidae) – known only from montane grassland at 1800 m in a small valley on the Zimbabwe side. But five other near-endemic species are known from montane grasslands or Afromontane forest along the Zimbabwe–Mozambique borderlands. Most of Zimbabwe's endemic butterflies are found in montane grassland and montane forest (Gardiner in BFA 2000).

Much more information is available on the butterflies of the Zimbabwe part of the Lower Rusitu Valley. Gardiner's unpublished chapter lists 199 species from a relatively small area (Annex 14, with common names). As he points out, many of them are characteristic of moist forest (48), some from miombo woodland (15) and some (12 of those listed) are typical of the East African coastal belt. However, no endemics were noted.

Based on published, but often incomplete, lists available for other Mozambique mountains, such as Mt Chiperone (56 species, Timberlake *et al.* 2007), Mt Inago (113 species, Bayliss *et al.* 2010), Mt Namuli (126 species above 1200 m, Timberlake *et al.* 2009) and Mt Mabu (203 species, Timberlake *et al.* 2012), the butterfly fauna of the montane parts of the Chimanimani Mountains should be in the order of 150–200 species, but many more if the lowland forests are included (300+).

What is now needed is a comprehensive checklist for the whole Chimanimani massif and TFCA, from mountain peaks and grasslands to lowland forests, miombo woodland and riparian woodlands. Much of this could be compiled from existing, although unpublished, records, but the need for a good butterfly survey of the mountains is probably one of the more important gaps in our biodiversity knowledge. Butterflies are not only reasonable indicators of ecosystem health, but can also be important for ecotourism. Unlike the case with many other invertebrate groups (except Odonata), the taxonomy is also fairly robust and good identification guides are available.

6.2 Other Invertebrates

The only biodiversity information located on other invertebrates is in the unpublished chapter of the Lower Rusitu Valley Visitor's Guide (BFA 2000) by Moira Fitzpatrick, based mostly on museum collections at the Natural History Museum in Bulawayo and two field visits – by Prince Edward School, Harare in 1965/66 (Rhodesian Schools Exploration Society 1965) and by the Biodiversity Foundation for Africa in 1995 (unpublished notes).

The main information available concerns Odonata (dragonflies and damselflies), the most obvious insects along rivers and streams within forest. A list of 22 species was given (Annex 15) but is obviously incomplete. Brief notes on some other invertebrates, such as beetles,

wasps, ants, scorpions and (in particular) spiders, are also given in this chapter. A new species of spider was described from the area as a result of the 1995 trip (FitzPatrick 2007).

A list of dragonflies could be fairly readily done, in part by collating existing records from museums and collections, but also by carrying out a good survey of both montane and lowland stream habitats. Odonata, both the species composition and relative abundance, are often considered to be good indicators of water quality, an issue of particular significance in the area now since gold panning activities started in the 2000s. And, as with butterflies, good identification guides are available for this group, and regional specialists can be found.

Another invertebrate group that is easier to identify and shows speciation across mountains is freshwater crabs (Daniels & Bayliss 2012). One species has been recorded from the forested footslopes in the Zomba area (*Potamonautes mutariensis*), otherwise only known from higher altitude areas in the Mutare and Nyanga areas of Zimbabwe. Species endemic to the Chimanimani area are likely to be found.

Obviously, the major gap in our biodiversity knowledge of the Chimanimani area is of all other invertebrate groups. The major reasons for this are probably the lack of regional specialists and the "taxonomic impediment", our inability to identify many collected specimens to species-level or even to genus.

7. BIBLIOGRAPHY

A bibliography of all references located concerning the biodiversity of the Chimanimani TFCA area is given as Annex 1. There are a number of other publications that are secondary or concern adjacent areas, such as the commercial farmlands and Forest Land in Zimbabwe or the similar Chirinda Forest (Timberlake & Shaw 1994), or cover topics that are not strictly biodiversity-related, but these are not included here. The bibliography restricts itself to the 126 publications or unpublished reports or web pages that have been found by the consultant and provide some primary biodiversity information on the area.

8. MAIN FINDINGS

General

1) The main summary documents on biodiversity in the TFCA Core and Buffer Zones are: Goodier & Phipps (1961), Phipps & Goodier (1962), Wild (1964) and Timberlake *et al.* (2016a, 2016b) for plants, Dutton & Dutton (1975) for vertebrates and general ecology, Beasley (1995) for birds, and the unpublished BFA book on the Lower Rusitu Valley (for all groups but only for a small area). The annexes to the 2010 TFCA Management Plan for the Mozambique side (Ghiurghi, Dondeyne & Bannermann 2010) are also a significant, albeit more general, information source.

2) Unlike the situation in many other conservation areas of south-central Africa, more is known about plants and plant ecology on the Chimanimani Mountains than about the vertebrates, probably because of the attractiveness and uniqueness of the flora. Although the plant information has now, to a significant extent, been consolidated and placed in a regional context, the same is not true for information on vertebrates, other than perhaps for birds.

Plants & Vegetation

3) Our knowledge on plant diversity in the montane areas (above 1200 m) is good and is also moderately well documented. However, our knowledge on the flora and vegetation of the miombo woodlands on the mid-slopes (400–1000 m) and on the forests and woodlands on the footslopes within the TFCA Buffer Zone is substantially less. Areas that have not been adequately investigated botanically are (a) the gorges in the south and east of the main massif, (b) the far southern end of the upland massif, especially the peaks, and (c) woodland areas in the mid-altitudinal range (400)600–1000(1200) m.

4) The total number of plant species recorded from the Chimanimani Mountains above an altitude of 1200 m is 977, of which 71 (7.4%) are believed to be endemic and thus not found elsewhere. Most of these endemics are confined to quartzite substrates, an area of only around 530 km^2. This is a particularly high level of endemism in southern Africa outside of the Cape Region, possibly the highest known. Total species number once the upland woodlands and montane forests are better recorded is likely to be around 1200 taxa.

5) The lowland forest flora, along with that of the miombo woodland, grassland and swamps on the lower slopes in Mozambique, is much less known. A full checklist is not available but would probably be in the order of 1000 species, without much overlap with species found in the montane areas. There are nine known endemics confined to this area of the TFCA, two of them from forest. The large tree *Maranthes goetzeniana*, common in these forests, possibly has its main global population here.

6) Across the montane massif there appears to be no apparent difference in plant species composition between the Mozambique and Zimbabwe sides, even though the smaller Zimbabwe side lies in a rain shadow with possibly lower rainfall. The habitats of particular interest are equally represented on both sides of the international border.

Vertebrates

7) The populations of large mammals appear to have decreased significantly across the TFCA over the last 40 years, mostly resulting from poaching but possibly in the lower forested areas also to habitat destruction. The total number of species recorded is around 90, with four of these now probably locally extinct and over 40% are small rodents, shrews or bats. The number of large antelopes, for which the montane areas were known in the past, has greatly reduced, but elephants are not uncommon in the lowland forest area around Mpunga/Moribane.

8) For birds, the TFCA on both sides of the border is regarded internationally as an Important Bird Area (IBA); that on the Zimbabwe side is considered as two separate IBAs – one in the mountains and one in the lowland forests. The total number of bird species recorded above 700 m is 185, while from the lowland areas in Zimbabwe 262 are recorded, 52 of which are true forest species. The total number of bird species found in the Chimanimani area – montane and lowland – has not yet been determined, but is probably over 400. The lowland forests on the Mozambique side have not yet been surveyed. There are seven globally threatened species present across the mountains.

9) The reptiles and amphibians of the TFCA have been moderately well-recorded, although the lowland forests in Mozambique are still poorly known. The total species number is around 68 reptiles and 37 amphibians, with only one endemic lizard from the lowland part of Zimbabwe and an endemic frog from the montane area.

10) The freshwater fishes of the upper Buzi catchment probably total around 70 species, although a full published list is not available. Given the environmental impact of gold-panning in the TFCA Core Zone, a priority is to look at fishes in fast-flowing upland streams and to determine their conservation status.

Invertebrates

11) Information on the various invertebrate groups – terrestrial and aquatic – is particularly weak compared to other areas in Zimbabwe. Surprisingly, no checklist is available for the butterflies of the montane area, a priority given the potential for range-restricted species there. The lowland forest area in Zimbabwe with 199 species is much better covered, although this list should be extended to the much more extensive forested areas in Mozambique.

12) Our knowledge on Odonata is also surprisingly weak given their ecological indicator value and the relative ease of identification. A dragonfly survey of the whole TFCA should be a priority.

13) There is virtually nothing recorded in other invertebrate groups, although their ecological indicator value given the threats from gold-panning and forest clearance is significant.

Ecology & Conservation

14) In the literature most of our knowledge (apart from plants and to a lesser extent for birds) is solely of species occurrence and sometimes distribution. Ecological issues such as factors determining presence or abundance have been much less looked at, with the notable exception of Phipps & Goodier (1962) for plants and vegetation. However, there are partial ecological accounts for birds in Vernon *et al.* (1989), Beasley (1995) and Childes & Irwin (BFA 2000), while Dutton & Dutton (1975) provide good information on the distribution of large mammals, at least during the colonial period.

15) In terms of information specifically on scientific conservation, the only publications appear to be Timberlake *et al.* (2016b) and Shah (2016) for plants, Childes & Mundy (1998, 2001) and Vincent (2001) for birds, and Dutton & Dutton (1975) for large mammals. More information on population and conservation status is required.

16) Nearly all of the important montane habitats (grassland, ericoid scrub, crags, Afromontane forest) are formally and adequately protected within the TFCA Core Zone; none are particularly under threat, nor are most of the endemic species there. There is minor habitat loss owing to small-scale mining activities, and a potentially larger – but unknown – threat from increased number and extent of wildfires. The spread of alien invasive species in the montane area is, so far, limited.

17) However, some important habitats (moist forest, semi-deciduous woodland, riverine woodland fringes, swamps and wetlands) in the Buffer Zone between 150 and 350 m altitude are under significant threat, habitats that are not found in the Core Zone. In particular, moist lowland forest on the Chimanimani footslopes in Mozambique is of very limited occurrence elsewhere, much of it having been cleared in the last 100 years or so elsewhere (e.g. the Amatongas forest). The main threat is the wide-scale clearance for fields and settlement, nearly all of it for shifting agriculture and with low agricultural return. Associated with such clearance is the widespread use of fire, which can spread through nearby non-agricultural areas and is often followed by invasion of the shrub

Vernonanthera phosphorica. This introduced species forms dense stands in disturbed or cleared areas, effectively stopping any forest regeneration, and also readily supports further fires in subsequent years. Although clearance and shifting cultivation have probably been practiced in this area for some hundreds of years, the pressure and extent since the mid-1990s are now much greater. Little recovery time now seems to be incorporated into the land system. It is the Buffer Zone on the Mozambique side where most conservation attention needs to be given, even though the biodiversity of the Core Zone may be of greater conservation significance.

18) Populations of large mammals in the Chimanimani Mountains appear to have decreased quite significantly over the last 20 years, although no quantitative evidence has been seen. This is probably related to poaching and disturbance from the large influx of small-scale miners. It is not known if this has led to any local species extinctions, or whether populations could recover rapidly if the miners were removed. In addition, it needs to be recognized that soils and forage quality in the mountains are nutrient-deficient, so large herbivore populations were probably always lower than in other montane areas such as Nyanga in Eastern Zimbabwe. Small mammal populations have probably not been affected so much, although some species are regularly hunted or snared for meat.

19) The elephant population, found primarily in the Moribane area, does not appear to have been affected by these changes so much, although conflict with cropping is a major issue.

20) The priority gaps or needs in our knowledge on biodiversity across the TFCA that need to be addressed are:

    a) A semi-detailed (e.g. 1: 50,000 scale) vegetation or habitat map of the whole TFCA, with particular reference to the lowland and mid-altitude areas. This would involve extensive fieldwork and the use of low-level aerial photography. Such a vegetation map should form the basic framework for management decision-making as well as being used to monitor forest loss.

    b) A comprehensive plant checklist for the whole TFCA, focussing in particular on the lowland forests, miombo woodland and swamp grasslands.

    c) Describe and better collect plants from the peaks above 2000 m altitude. It is these species and associations that will most come under threat from climate change as they will not be able to move to cooler environments.

    d) Further detailed knowledge is required on the population status and threats to endemic species, especially plants in order to help inform management decisions. Of particular concern is determination of the impact of increased fire frequency on plant populations and vegetation types such as Ericoid scrub and Afromontane forest.

    e) Determination of the population status and present distribution of large mammal populations, particularly across the upland areas.

    f) Compilation of an annotated bird checklist for the whole TFCA. Any fieldwork required should focus on the lowland forests and woodlands.

    g) A butterfly survey and checklist. Fieldwork is needed in montane areas on both sides of the border, and should also cover the montane forests as well as in the forests and wetlands at lower altitudes.

    h) An Odonata (dragonfly) survey and checklist covering both montane and lowland areas, in order to help monitor and assess the environmental impacts of mining activities.

9. RECOMMENDATIONS

1) Further specific survey and documentation work needs to be done as indicated under gaps (see under 20 above) in order to provide a scientific and rational basis for management decisions, especially as regards any threatened habitats and species of particular interest. Reserve management needs to be better underpinned by scientific and technical information.

2) Population studies on a comprehensive range of the endemics are required. At present we know only their distribution, but have limited information on species frequency and population structure. Plant studies, and those on other biological groups, now need to move on from the inventory stage to ecological questions and conservation.

3) More attention should be given to assessing the role of ecosystem services provided by the Chimanimani massif and its vegetation. This would look particularly at water supplies and their distribution throughout the year.

4) The importance of wetlands in the Buffer Zone needs to be brought out more, not least in the ecosystem services they provide. Of particular concern is the removal of riverbank vegetation and pollution of swamp waters.

5) A monitoring programme on forest loss should be initiated on the lowland Mozambique side. This should be linked to monitoring of the spread of alien invasive species such as *Vernonanthura*, as well as to the incidence and distribution of wildfires across the whiole TFCA.

6) Harmonisation of TFCA management across the international border is required, for example in control and reduction of wildfires, action addressing small-scale mining activity and associated traders and trading, poaching, spread of invasive species, tourism, and possibly also in research.

7) Linked to this could be the development of small field guides on selected biological groups (e.g. an annotated bird checklist) and basic explanatory texts, both for ecotourism and for local schools. Numbered trails with guides, as has been done at Ndzou Camp, should be expanded, particularly in the upland areas.

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ANNEX 2. Summarized relationships of Chimanimani plant communities and ecological factors (modified from Phipps & Goodier 1962). Source: Timberlake *et al.* (2016b).

Ecological factors	Level ground/ deeper soil	Medium slope/ shallower soil	Rocky slopes, crags	Schist soils	Quartzite soils	Permanently high water table soils	Seasonally high water table soils	Moist but well-drained soils	Severe fires	Moderately hot fires	Fires rare	Fires occasional	Aquatic	Wind-exposed areas	Sheltered areas	Below 1500 m	1350-1650 m	Above 1650 m
A. FOREST																		
Ai) Dry montane forest	×	×		×	×			×			×				×	×	×	
Aii) Marginal (seral) forest	×	×	×	×	×			×				×			×	×		
B. WOODLAND																		
Bi) *Uapaca kirkiana* woodland		×		×	×		×			×				×		×	×	
Bii) *Brachystegia spiciformis* woodland		×		×			×			×				×		×	×	
Biii) *Br. tamarindoides* woodland		×			×		×			×				×		×	×	
C. SCRUB																		
Ci) Ericaceous scrub			×		×			×			×	×		×	×		×	×
Cii) Proteaceous scrub	×	×		×	×		×			×		×		×			×	×
D. GRASSLAND																		
Di) On quartzite terraces	×				×		×		×	×				×		×	×	
Dii) On schist slopes	×			×			×		×					×		×	×	
Diii) Hydromorphic grasslands	×			×	×	×			×					×			×	
E. AQUATIC COMMUNITIES													×			×	×	
F. LITHOPHYTIC COMMUNITIES			×		×							×		×	×	×	×	×

ANNEX 3. LIST OF PLANTS FROM THE LOWER RUSITU VALLEY (HARONI, RUSITU & AND MAKURUPINI FORESTS)

This is a draft checklist produced from an earlier unpublished list in the National Herbarium, Harare (Timberlake 1999). The altitudinal limits are not clear, but could extend up to 800 m or higher. Nomenclature and family arrangement has not been updated or corrected from that time, so it is not strictly comparable with Annex 4 or with the forthcoming Chimanimani montane checklist (Wursten *et al.* 2017).

Compiled from collections made by:

R.B. Drummond	Nov 1955	T. Müller & R.D. Kelly	May 1969
J.S. Ball	1959-1963	T.M. Wild & J. King	Aug 1969
H. Wild	April 1962	T. Müller, T.A.D. Gordon & G. Pope	June 1971
H. Wild, B. Goldsmith & T. Müller	Dec 1964	Vakwashi Expedition	1973
RSES "Chironi" Expedition	Aug-Sept, Dec 1965	T. Müller	1975
		J. & S. Burrows (fern book)	1990
B.K. Simon & J.F. Ngoni	Nov 1967	J. Timberlake & I. Mapaure	Dec 1991
RSES Expedition	Jan 1969	Flora Zambesiaca	1960 onward
H.M. Biegel, S. Mavi & I. MacDonald	Jan 1969	S. Mavi	1998

Life-form: t tree; s shrub; h herb; cl climber; e epiphyte

Habitat: F forest; W woodland/bushland; C fallow/cultivation; O other

FAMILY/Species/*authority*	l/f	habitat
PTERIDOPHYTA		
Adiantaceae		
Cheilanthes viridis *(Forssk.) Sw.* var. glauca *(Sim) Schelpe* (=Pellaea viridis)	h	
Adiantum mendonçae *Alston*	h	
Pellaea calomelanos *(Sw.) Link* var. swynnertoniana *(Sim) Schelpe*	h	
Pellaea doniana *Hook.*	h	
Pellaea pectiniformis *Baker*	h	
Aspidiaceae		
Ctenitis cirrhosa *(Schumach.) Ching*	h	
Tectaria gemmifera *(Fée) Alston*	h	
Aspleniaceae		
Asplenium aethiopicum *(Burm.f.) Becherer*	h	
Asplenium atroviride *Schelpe*	h	
Asplenium blastophorum *Hieron.*	h	
Asplenium buettneri *Brause*	h	
Asplenium dregeanum *Kuntze*	h	
Asplenium holstii *Hieron.*	h	
Asplenium inaequilaterale *Willd.*	h	
Asplenium pellucidum *Lam.* subsp. pseudohorridum *(Hieron.) Schelpe*	h	
Asplenium ramlowii *Hieron.*	h	
Asplenium rutifolium *(Berg.) Kuntze*	h	
Blechnaceae		
Stenochlaena tenuifolia *(Desv.) Moore*	h	
Cyatheaceae		
Cyathea sp.aff. C. mossambicensis *Baker*	h	

Davalliaceae		
Nephrolepis biserrata *(Sw.) Schott*	h	
Dennstaedtiaceae		
Blotiella natalensis *(Hook.) Tryon*	h	
Microlepia speluncae *(L.) T.Moore*	h	
Equisetaceae		
Equisetum ramosissimum *Desf.*	h	
Grammitidaceae		
Grammitis serrulata *(Sw.) Sw.* (=Xiphopteris serrulata)	h	
Hymenophyllaceae		
Hymenophyllum capense *Schrad.* (=H. polyanthos var. mossambicense)	h	
Trichomanes melanotrichum *Schlect.* (=T. pyxidiferum var. melanotrichum)	h	
Trichomanes rigidum *Sw.*	h	
Lindsaeaceae		
Lindsaea ensifolia *Sw.*	h	
Lindsaea odorata *Roxburgh*	h	
Lomariopsidacea		
Bolbitis gemmifera *(Hieron.) C.Chr.*	h	
Bolbitis heudelotii *(Fée) Alston*	h	
Elaphoglossum acrostichoides *(Hook.& Grev.) Schelpe*	h	
Elaphoglossum petiolatum *(Sw.) Urb.* subsp. salicifolium *(Kaulf.) Schelpe*	h	
Lycopodiaceae		
Lycopodium carolinianum *L.* var. carolinianum (=var. affine)	h	
Lycopodium cernuum *L.*	h	
Marattiaceae		
Marattia fraxinea *J.F.Gmel.* var. salicifolia *(Schrad.) C.Chr.*	h	
Osmundaceae		
Osmunda regalis *L.*	h	
Todea barbara *(L.) T.Moore*	h	
Polypodiaceae		
Microgramma lycopodioides *(L.) Copel.*	h	
Microsorium punctatum *(L.) Copel.*	e	F
Microsorium scolopendrium *(Burm.f.) Copel.* (=Phymatodes scolopendria)	e	F
Platycerium alcicorne *Desv.*	e	F
Pyrrosia lanceolata *(L.) Farw.*	h	
Psilotaceae		
Psilotum nudum *(L.) Beauv.*	h	
Schizaeaceae		
Anemia simii *Tardieu*	h	
Lygodium kerstenii *Kuhn*	h	
Selaginellaceae		
Selaginella dregei *(C.Presl.) Hieron.*	h	
Selaginella kraussiana *(Kunze) A.Br.*	h	
Selaginella mittenii *Baker*	h	
Thelypteridaceae		
Thelypteris confluens *(Thunb.) Morton*	h	
Thelypteris dentata *(Forssk.) E.St.John* var. buchananii *Schelpe*	h	
Thelypteris gueinziana *(Mett.) Schelpe*	h	

Thelypteris hispidula *(Decne.) Reed* (=T. quadrangularis)	h	
Thelypteris interrupta *(Willd.) K.Iwats*	h	
Vittariaceae		
Vittaria elongata *Sw.*	h	
Vittaria ensiformis *Sw.*	h	
Vittaria isoetifolia *Bory*	h	
Vittaria volkensii *Hieron.*	h	
GYMNOSPERMS		
Podocarpaceae		
Podocarpus latifolius *(Thunb.) Mirb.* (=P. milanjianus)	t	F
Zamiaceae		
Encephalartos manikensis *(Gilliland) Gilliland* (=E. chimanimaniensis)	t	
MONOCOTYLEDONS		
Agavaceae		
Dracaena mannii *Baker* var. nitens *(Baker) Baker)* (=D. reflexa var. nitens)		
Dracaena usambarensis *Engl.*		
Sansevieria conspicua *N.E.Br.*		
Aloaceae		
Aloe ballii *Reynolds* var. ballii		
Aloe ballii *Reynolds* var. makurupiniensis *A.Ellert*		
Aloe hazeliana *Reynolds*		
Aloe swynnertonii *Rendle*		
Amaryllidaceae		
Crinum sp.	h	
Cryptostephanus vansonii *I.Verd.*		
Haemanthus pole-evansii *Oberm.*	h	
Anthericaceae		
Chlorophytum galpinii *(Baker) Kativu* (=Anthericum galpinii)	h	
Chlorophytum blepharophyllum *Baker*	h	
Chlorophytum bowkeri *Baker*	h	
Chlorophytum brevipes *Baker*	h	
Aponogetonaceae		
Aponogeton desertorum *Spreng.*	h	W
Araceae		
Colocasia esculenta *(L.) Schott*	h	C
Culcasia scandens *P.Beauv.*	h	
Gonatopus boivinii *(Decne.) Engl.*	h	
Xanthosoma mafaffa *Schott*	h	
Zamioculcas zamiifolia *(Lodd.) Engl.*		
Arecaceae (Palmae)		
Borassus aethiopum *Mart.*	t	C
Hyphaene coriacea *Gaertn.*	t	C
Phoenix reclinata *Jacq.*	s	W
Asparagaceae		
Asparagus asparagoides *(L.) W.Wight*	h	
Asparagus falcatus *L.*	h	

Asparagus setaceus *(Kunth) Jessop*	h	
Asparagus virgatus *Baker*	h	
Bromeliaceae		
Ananas comosus *(L.) Merr.*	h	C
Burmanniaceae		
Burmannia madagascariensis *Baker*	h	F
Cannaceae		
Canna indica *L.*	h	C
Commelinaceae		
Aneilema aequinoctiale *(P.Beauv.) Loudon*	h	
Coleotrype natalensis *C.B.Clarke*	h	
Commelina diffusa *Burm.f.*	h	
Commelina eckloniana *Kunth*	h	
Commelina sphaerosperma *C.B.Clarke*	h	
Cyanotis foecunda *Hassk.*	h	
Floscopa glomerata *(Schult.& Schult.f.) Hassk.*		
Murdannia simplex *(Vahl) Brenan*		
Cyperaceae		
Bulbostylis burchellii *(Fic.& Heirn.) C.B.Clarke*		
Bulbostylis contexta *(Nees) Bodard*		
Bulbostylis pilosa *(Willd.) Chem.*		
Carex spicatopaniculata *C.B.Clarke*		
Coleochloa setifera *(Ridl.) Gilly*		
Costularia natalensis *C.B.Clarke*		
Cyperus albostriatus *Schrad.*		
Cyperus compressus *L.*	h	C
Cyperus difformis *L.*		
Cyperus distans *L.f.*	h	C
Cyperus ?hensii *C.B.Clarke*		
Cyperus immensus *C.B.Clarke*		
Cyperus leptocladus *Kunth*		
Cyperus kirkii *C.B.Clarke*		
Cyperus rubroviridis *Cherm.*	h	C
Cyperus tenax *Boeckler*		
Cyperus tenuispica *Steud.*		
Fimbristylis dichotoma *(L.) Vahl*		
Fimbristylis hispidula *(Vahl) Kunth*		
Kyllinga crassipes *Boeckeler*		
Kyllinga odorata *Vahl*	h	W
Kyllinga pumila *Michx.*	h	
Mariscus alternifolius *Vahl*	h	C
Mariscus dubius *(Rottb.) C.E.C.Fischer*	h	W
Mariscus hemisphaericus *(Boeck.) C.B.Clarke*	h	W
Mariscus sieberianus *C.B.Clarke*	h	
Pycreus pelophilus *(Ridl.) C.B.Clarke*	h	C
Pycreus polystachyos *(Rottb.) P.Beauv.*	h	C
Scleria pachyrrhyncha *Nelmes*		
Scleria racemosa *Poir.*		

Dioscoraceae		
Dioscorea dumetorum *(Kunth) Pax*	cl	Fo
Dioscorea praehensilis *Benth.*	cl	W
Dioscorea quartiniana *A.Rich.*	cl	W
Eriocaulaceae		
Eriocaulon africanum *Hochst*.	h	F
Mesanthemum africanum *Moldenke*	h	W
Hypoxidaceae		
Hypoxis angustifolia *Lam*.	h	
Hypoxis villosa *L.f.* (=H. nyasica)	h	
Iridaceae		
Crocosmia aurea *(Hook.) Planch.* subsp. aurea	h	
Dierama pendulum *(L.f.) Baker*	h	
Dietes iridioides *(L.) Klatt* (=D. prolongata)	h	
Gladiolus sp.	h	
Lapeirousia erythrantha *(Klatt) Baker*	h	
Hyacinthaceae		
Albuca angolensis *Welw.*		
Dianella ensifolia *(L.) Red.*		
Dipcadi longifolium *(Lindl.) Baker*		
Gloriosa superba *L*.		
Ledebouria sp.		
Ornithogalum ecklonii *Fisch.& C.A.Mey.* (=Albuca virens)		
Urginea sp.		
Musaceae		
Musa acuminata *Colla*	s	C
Orchidaceae		
Acamps pachyglossa *Rchb.f.*	e	
Aerangis kotschyana *(Rchb.f.) Schltr.*	e	
Aerangis mystacidii *(Rchb.f.) Schltr.*	e	
Aerangis rusituensis *Fibeck & Dare*	e	
Angraecopsis parviflora *(Thou.) Schltr*	e	
Angraecum chamaeanthus *Schltr*.	e	
Angraecum cultriforme *Summerh*.	e	
Angraecum minus *Summerh*.	e	
Angraecum pusillum *Lindl*.	e	
Ansellia africana *Lindl*.	e	
Bolusiella iridifolia *(Rolfe) Schltr.* subsp. picae *P.Cribb*	e	
Bulbophyllum ballii *Cribb*	e	
Bulbophyllum elliotti *Rolfe*	e	
Bulbophyllum encephalodes *Summerh*.	e	
Bulbophyllum fuscum *Lindl*. var. melinostachym *(Schltr.) J.J.Verm.*	e	
Bulbophyllum humblotii *Rolfe*	e	
Bulbophyllum longiforum *Thou*. (Cirrhopetalum umbellatum *(Forst.f.) Hook.& Arn.*)	e	
Bulbophyllum maximum *(Lindl.) Rchb.f.*	e	
Bulbophyllum platyrhachis Rolfe	e	
Bulbophyllum sandersonii *(Hook.f.) Rchb.f.* subsp. sandersonii	e	
Bulbophyllum scaberulum *(Rolfe) Bolus* var. scaberulum	e	

Chaseella pseudohydra *Summerh.*	e	
Cynorkis anisoloba *Summerh.*	h	
Cynorkis hanningtonii *Rolfe*	h	
Cynorkis kirkii *Rolfe*	h	
Cyrtorchis arcuata *(Lindl.) Schltr.* subsp. arcuata	e	
Cyrtorchis praetermissa *Summerh.* subsp. praetermissa	e	
Diaphananthe fragrantissima *(Rchb.f.) Schltr.*	e	
Diaphananthe rutila *(Rchb.f.) Summerh.*	e	
Diaphananthe xanthopollinia *(Rchb.f.) Summerh.*	e	
Disperis leuconeura *Schltr.*	h	
Eulophia stachyodes *Rchb.f.*	h	
Eulophia longisepala *Rendle*	h	
Habenaria macrandra *Lindl.*	h	
Habenaria tridens *Lindl.*	h	
Jumellea filicornoides *(De Wild). Schltr.*	e	
Liparis bowkeri *Harv.*	h	
Microcoelia exilis *Lindl.*	e	
Nervilia adolphi *Schltr.* var. adolphi	h	
Nervilia kotschyi *(Rchb.f.) Schltr.* var. kotschyi	h	
Oberonia disticha *(Lam.) Schltr.*	e	
Oeceoclades maculata *(Lindl.) Lindl.*	h	
Oeceoclades makenii *(Hemsl.) Garay & P.Taylor*	h	
Oeceoclades pulchra *(Thou.) Clements & Cribb*	h	
Oeceoclades quadriloba *(Schltr.) Garay & P.Taylor*	h	
Polystachya albescens *Ridl.* subsp. imbricata *(Rolfe) Summerh.*	e	
Polystachya caespitifica *Engl.* subsp. hollandii *(L.Bolus) Cribb & Podzorski*	e	
Polystachya dendrobiiflora *Rchb.f.*	h	
Polystachya fusiformis *Lindl.*	e	
Polystachya golungensis *Rchb.f.*	e	
Polystachya simplex *Rendle*	e	
Polystachya stuhlmannii *Kraenzl.*	e	
Polystachya tessellata *Lindl.*	e	
Polystachya transvaalensis *Schltr.*	e	
Polystachya vaginata *Summerh.*	e	
Polystachya zambesiaca *Rolfe*	e	
Rangaeris muscicola *(Rchb.f.) Summerh.*	e	
Solenangis aphylla *(Thou.) Summerh.*	e	
Tridactyle anthomaniaca *(Rchb.f.) Summerh.*	e	
Tridactyle bicaudata *(Lindl.) Schltr.*	e	
Tridactyle inaequilonga *(De Wild) Schltr.*	e	
Tridactyle tridactylites *(Rolfe) Schltr.*	e	
Tridactyle tridentata *(Harv.) Schltr.*	e	
Vanilla polylepis *Summerh.*	e	
Ypsilopus erectus *(Cribb) Cribb & J.Stewart*	e	
Zeuxine elongata *Rolfe*	h	
Pandanaceae		
Pandanus livingstonianus *Rendle*	t	

Poaceae (Gramineae)		
Andropogon schirensis *A.Rich.*	h	
Aristida junciformis *Trin.& Rupr.* (=A. pardyi (BKS 1324))	h	
Brachiaria scalaris *Pilg.*	h	
Danthoniopsis chimanimaniensis *(Phipps) Clayton*	h	
Digitaria debilis *(Desf.) Willd.*	h	
Digitaria eriantha *Steud.* (=D. nemoralis)	h	
Digitaria maitlandii *Stapf & C.E.Hubbard*	h	
Digitaria milanjiana *(Rendle) Stapf*	h	
Digitaria nitens *Rendle*	h	
Digitaria velutina *(Forssk.) Beauv.*	h	
Eleusine africana *Kenn.-O'Byrne*	h	
Eleusine coracana *(L.) Gaertn.*	h	C
Elionurus muticus *(Spreng.) Kunth* (=E. argenteus)	h	
Eragrostis ciliaris *(L.) R.Br.*	h	
Eragrostis lappula *Nees*	h	
Eragrostis mollior *R.E.Fr.*	h	
Eragrostis tenuifolia *(A.Rich.) Steud.* (=E. plana)	h	
Hyparrhenia diplandra *(Hack.) Stapf*	h	
Imperata cylindrica *(L.) Beauv.*	h	C
Leersia hexandra *Sw.*	h	
Loudetia simplex *(Nees) C.E.Hubbard*	h	
Megastachya mucronata *(Poir.) Beauv.*	h	
Melinis macrochaeta *Stapf & C.E.Hubbard*	h	
Melinis nerviglumis *(Franchet) Zizka* (=Rhynchelytrum setifolium)	h	C
Monocymbium ceresiiforme *(Nees) Stapf*	h	
Olyra latifolia *L.*	h	F
Oplismenus compositus *(L.) Beauv.*	h	
Oplismenus hirtellus *(L.) Beauv.*	h	
Oryza sativa *L.*	h	C
Panicum brevifolium *L.*	h	
Panicum dregeanum *Nees*	h	
Panicum hymeniochilum *Nees* (=P. snowdenii)	h	
Panicum maximum *Jacq.*	h	
Panicum monticola *Hook.f.*	h	
Panicum nervatum *(Franch.) Stapf* (=P. subrepandum)	h	
Panicum peteri *Pilg.*	h	
Panicum trichocladum *K.Schum.*	h	
Panicum sp. (BKS 1296)	h	
Panicum sp. (BKS 1284)	h	
Paspalum scrobiculatum *L.* (=P. auriculatum)	h	
Pennisetum polystachion *(L.) Schult.* subsp. polystachion	h	C
Perotis patens *Gand.*	h	C
Phragmites mauritianus *Kunth*	h	W
Pseudoechinolaena polystachya *(Kunth) Stapf*	h	
Saccharum officinarum *L.*	h	C
Sacciolepis curvata *(L.) Chase*	h	
Setaria homonyma *(Steud.) Chiov.*	f	C

Setaria sphacelata *(Schumach.) Moss* (=S. anceps)	h	
Setaria megaphylla *(Steud.) Th.Dur.& Schinz*	h	F
Sorghum arundinaceum *(Desv.) Stapf.* (=S. verticilliflorum)	h	C
Sorghum bicolor *(L.) Moench*	h	C
Sporobolus festivus *A.Rich.*	h	C
Sporobolus pyramidalis *P.Beauv.*	h	C
Zea mays *L.*	h	C
Potamogetonaceae		
Potamogeton octandrus *Poir.*	h	W
Potamogeton schweinfurthii *A.W.Benn.*	h	W
Potamogeton trichoides *Cham.& Schltdl.*	h	W
Smilacaceae		
Smilax kraussiana *Meisn.*	cl	F
Taccaceae		
Tacca leontopetaloides *(L.) Kuntze*	h	C
Velloziaceae		
Xerophyta viscosa *Baker*	h	W
Xyridaceae		
Xyris congoensis *Büttner* (=X. hildebrandtii)	h	W
Zingiberaceae		
Aframomum angustifolium *(Sonn.) K.Schum.*	h	F
Costus afer *Ker Gawl.*	h	
Siphonochilus kirkii *(Hook.f.) B.L.Burtt* (=Kaempferia decora)	h	
Zingiber officinale *Roscoe*	h	C
DICOTYLEDONS		
Acanthaceae		
Asystasia gangetica *(L.) T.Anderson*		
Brillantaisia cicatricosa *Lindau* (=B. subulugurica)		
Dyschoriste nagchana *(Nees) Bennet* (=D. radicans)		
Hypoestes aristata *(Vahl) Roem.& Schult.*	h	
Justicia betonica *L.*	h	
Justicia matammensis *(Schweinf.) Oliv.*	h	C
Justicia nyassana *Lindau*	h	W
Justicia striata *(Klotzsch) Bullock*		
Justicia tenella *(Nees) T.Anderson*	h	C
Phaulopsis imbricata *(Forssk.) Sweet*		
Pseuderanthemum subviscosum *(C.B.Clarke) Stapf*		
Sclerochiton coeruleus *(Lindau) S.Moore*	h	W
Thunbergia alata *Sims*	h	
Amaranthaceae		
Amaranthus hybridus *L.*	h	C
Amaranthus spinosus *L.*	h	C
Amaranthus thunbergii *Moq.*	h	C
Celosia trigyna *L.*		
Centemopsis gracilenta *(Hiern) Schinz*		
Cyathula achyranthoides *(Kunth) Moq.*	h	F
Cyathula prostrata *(L.) Blume* var. prostrata (=C. pedicellata)	h	F

Nothosaerva brachiata *(L.) Wight*		
Psilotrichum sclerathum *Thw.*	s	F
Pupalia lappacea *(L.) A.Juss.* var. velutina *(Moq.) Hook.f.*	h	C
Anacardiaceae		
Anacardium occidentale *L.*	t	C
Lannea schweinfurthii *(Engl.) Engl.*	t	W
Mangifera indica *L.*	t	C
Rhus chirindensis *Baker f.*	s	W
Sclerocarya birrea *(A.Rich.) Hochst* subsp. caffra *(Sond.) Kokwaro*	t	W
Trichoscypha ulugurensis *Mildbr.*	t	F
Annonaceae		
Annona senegalensis *Pers.*	s	W
Artabotrys brachypetalus *Benth.*	cl	F
Monanthotaxis chasei *(N.Robson) Verdc.* (=Uvaria chasei)		
Xylopia aethiopica *(Dunal) A.Rich.*	t	F
Xylopia parviflora *(A.Rich.) Benth.* (=X. holtzii)	t	F
Apiaceae		
Centella asiatica *(L.) Urb.*	h	C
Apocynaceae		
Alafia orientalis *De Wild.* (=A. schumannii)	cl	F
Ancylobothrys petersiana *(Klotzsch) Pierre* (=Landolphia petersiana)	cl	W
Carissa bispinosa *(L.) Brenan* subsp. zambesiensis *Kupicha* (=var. acuminata)	s	W
Catharanthus roseus *(L.) G.Don*	h	C
Dictyophleba lucida *(K.Schum.) Pierre*	cl	F
Diplorhynchus condylocarpon *(Müll.Arg.) Pichon*	t	W
Funtumia africana *(Benth.) Stapf* (=F. latifolia)	t	F
Landolphia buchananii *(Hall.f.) Stapf*	cl	F
Landolphia kirkii *T.Dyer*	cl	W
Mascarenhasia arborescens *A.DC.*	s	F
Ocinotis tenuiloba *Stapf* (=O. inandensis)	cl	F
Saba comorensis *(Bojer) Pichon* (=S. florida)	cl	W
Strophanthus courmontii *Franch.*	cl	F
Strophanthus petersianus *Klotzsch*	cl	W
Tabernaemontana elegans *Stapf*	s	W
Tabernaemontana ventricosa *A.DC.*	s	W
Voacanga thouarsii *Roem.& Schult.*	t	F
Araliaceae		
Schefflera umbellifera *(Sond.) Baillon*	t	F
Asclepiadaceae		
Aspidoglossum sp.		
Ceropegia sp.		
Cryptolepis apiculata *K.Schum.*	cl	W
Ectadiopsis oblongifolia *(Meisn.) B.D.Jacks*		
Marsdenia ?macrantha *(Klotzsch) Schltr.* (=Dregea macrantha)		
Pergularia daemia *(Forssk.) Chiov.*	cl	C
Raphionacme sp.		
Asteraceae (Compositae)		
Acanthospermum australe *(Loefl.) Kuntze*	h	C

Ageratum conyzoides *(L.) L.*	h	C
Anisopappus lastii *(O.Hoffm.) Wild*	h	C
Anisopappus sparsum (?)	h	
Bidens pilosa *L.*	h	C
Bidens steppia *(Steetz) Sherff*	h	
Brachylaena rotundata *S.Moore*	s	W
Cineraria erosa *(Thunb.) Willd.*	h	
Cineraria grandiflora *Vatke*	h	
Conyza canadensis *(L.) Cronquist*	h	
Conyza hochstetteri *A.Rich.*	h	
Crassocephalum crepidioides *(Benth.) S.Moore*	h	
Crassocephalum picridifolium *(DC.) S.Moore*		
Dicoma anomala *Sond.*	h	W
Emilia coccinea *(Sims) G.Don*	h	
Emilia discifolia *(Oliv.) C.Jeffrey* (=Senecio discifolius)	h	
Erythrocephalum zambesianum *Oliv.& Hiern*	h	
Geigeria africana *Griess.*	h	
Guizotia scabra *(Vis.) Chiov.*	h	W
Gutenbergia westii *(Wild) Wild & G.V.Pope* (=Erlangea westii)	h	
Helichrysum adenocarpum *DC.*	h	
Helichrysum nitens *Oliv.& Hiern*	h	
Helichrysum rhodellum *Wild*	h	
Hypericophyllum elatum *(O.Hoffm.) N.E.Br.*	h	
Mikania cordata *(Burm.f.) B.L.Rob.*	h	
Osteospermum muricatum *DC.*	h	
Schistostephium oxylobum *S.Moore*	h	
Senecio oxyrifolius *DC.*	h	
Solanecio angulatus *(Vahl) C.Jeffrey* (=Crassocephalum bojeri)	h	
Vernonia acuminatissima *S.Moore* (=V. rogersii)	h	C
Vernonia amygdalina *Delile*		
Vernonia calvoana *(Hook.f.) Hook.f.* subsp. meridionalis *(Wild) C.Jeffrey* (=V. bracteosa)	h	F
Vernonia cinerea *(L.) Less.*	h	C
Vernonia glaberrima *O.Hoffm.*	h	W
Vernonia muelleri *Wild* subsp. muelleri	h	F
Vernonia wollastonii *S.Moore* (=V. umbratica)	s	F
Balsaminaceae		
Impatiens salpinx *Schulze & Laurent*	h	W
Impatiens wallerana *Hook.f.*	h	F
Bignoniaceae		
Markhamia obtusifolia *(Baker) Sprague*	t	F
Markhamia zanzibarica *(DC.) K.Schum.* (=M. acuminata)	t	F W
Boraginaceae		
Cynoglossum lanceolatum *Forssk.*		
Heliotropium zeylanicum *(Burm.f.) Lam.* (=H. subulatum)		
Cactaceae		
Rhipsalis baccifera *(J.Mill.) W.T.Stearn*	e	F
Capparaceae		
Cleome gynandra *L.*		

Cleome monophylla *L.*	h	
Caricaceae		
Carica papaya *L.*	t	C
Caryophyllaceae		
Drymaria cordata *(L.) Willd.*	h	F
Celastraceae		
Allocassine laurifolia *(Harv.) N.Robson*	s	F
Cassine aethiopica *Thunb.*		
Catha edulis *(Vahl) Endl.*		F
Elaeodendron capense *Eckl.& Zeyh.* (=Cassine papillosa)	t	
Hippocratea africana *(Willd.) Engl.*	cl	
Hippocratea pallens *Oliv.*	cl	F
Hippocratea volkensii *Loes.*	s	W
Salacia leptoclada *Tul.*	s	F
Chenopodiaceae		
Chenopodium ambrosioides *L.*		
Chrysobalanaceae		
Maranthes goetzeniana *(Engl.) Prance* (=M. glabra)	t	F
Parinari curatellifolia *Benth.*	t	W
Clusiaceae (Guttiferae)		
Garcinia kingaensis *Engl.*	s	F
Harungana madagascariensis *Poir.*	t	W
Hypericum roeperanum *A.Rich.*	s	W
Psorospermum febrifugum *Spach*	s	W,C
Combretaceae		
Combretum coriifolium *Engl.& Diels*	cl	F
Combretum molle *R.Br.*	t	W
Combretum paniculatum *Vent.*	cl	W
Combretum psidioides *Welw.*	t	W
Combretum zeyheri *Sond.*	t	W
Pteleopsis myrtifolia *(C.Laws.) Engl.& Diels*	t	F
Connaraceae		
Agelaea heterophylla *Gilg*	cl	F
Cnestis natalensis *(Krauss) Sond.*	cl	F
Rourea orientalis *Baill.* (=Byrsocarpus orientalis)	s	C
Santaloides afzelii *(Planch.) Schellenb.*	cl	F
Convolvulaceae		
Astripomoea malvacea *(Klotzsch) Meeuse* var. malvacea	h	C
Dichondra repens *J.R.& G.Forst.*	h	C
Hewittia scandens *(Milne) Mabberley* (=H. sublobata)		
Ipomoea batatas *(L.) Lam.*	h	C
Ipomoea pes-tigridis *L.* var. pes-tigridis		
Ipomoea pileata *Roxb.*		
Ipomoea plebeia *R.Br.* subsp. africana *Meeuse*		
Ipomoea wightii *(Wall.) Choisy* var. wightii	h	C
Lepistemon owariense *(Beauv.) Hall.f.*	cl	C
Merremia pterygocaulos *(Choisy) Hall.f.*	cl	C
Merremia tridentata *(L.) Hall.f.* subsp. alatipes *(Dammer) Verdc.*		

Stictocardia laxiflora *(Baker) Hall.f.* var. laxiflora	cl	W
Crassulaceae		
Crassula swaziensis *Schönl.* (=C. argyrophylla)	h	W
Kalanchoe lateritia *Engl.* (=K. velutina)	h	W
Cucurbitaceae		
Coccinea adoensis *(A.Rich.) Cogn.*	h	W
Coccinea barteri *(Hook.f.) Keay*	h	F
Cucurbita pepo *L.*	h	C
Lagenaria siceraria *(Molina) Standley*	h	C
Momordica boivinii *Baill.*	h	W
Momordica foetida *Schumach.*	h	F
Mukia maderaspatana *(L.) M.J.Roem.*	h	C
Peponium chirindense *(Bak.f.) Cogn.*	cl	F
Raphidiocystis chrysocoma *(Schumach.) C.Jeffrey*	cl	F
Zehneria scabra *Sond.*		
Dichapetalaceae		
Dichapetalum thouarsianum *Roem.& Schult.*	s	W
Ebenaceae		
Diospyros ferrea *(Willd.) Bakh.*	t	F
Diospyros natalensis *(Harv.) Brenan* subsp. natalensis	t	F
Ericaceae		
Erica pleiotricha *S.Moore* var. blaeriodes *(Wild) Ross* (=E. eylesii)		
Erica johnstoniana *Britten*		
Erythroxylaceae		
Erythroxylum emarginatum *Thonn.*		
Euphorbiaceae		
Acalypha ornata *A.Rich.*		
Acalypha racemosa *Baill.* (=A. paniculata)		
Acalypha villicaulis *Hochst.* (=A. senensis)		
Acalypha welwitschiana *Müll.Arg.*	h	W
Alchornea hirtella *Benth.* forma glabrata *(Müll.Arg.) Pax & K.Hoffm.* (=A. glabrata)	t	F
Alchornea laxiflora *(Benth.) Pax & K.Hoffm.*		
Antidesma membranaceum *Müll.Arg.*		F
Antidesma venosum *Tul.*	s	W
Bridelia atroviridis *Müll.Arg.*	t	F
Bridelia micrantha *(Hochst.) Baill.*	t	W
Cleistanthus polystachyus *Planch.* subsp. milleri *(Dunkley) Radcl.Sm.* (=C. apetalus)	t	F
Clutia abyssinica *Jaub.& Spach*		
Clutia swynnertonii *S.Moore*		
Croton sylvaticus *Krauss*	t	F
Drypetes arguta *(Müll.Arg.) Hutch.*	t	F
Drypetes gerrardii *Hutch.*	t	F
Drypetes natalensis *(Harv.) Hutch.*		F
Euphorbia hirta *L.*		
Hymenocardia acida *Tul.*		
Hymenocardia ulmoides *Oliver*	t	F
Macaranga capensis *(Baill.) Sim*	t	F
Maprounea africana *Müll.Arg.*	t	W

Phyllanthus angolensis *Müll.Arg*.		
Margaritaria discoidea *(Baill.) G.L.Webster* var. nitida *(Pax) Radcl.-Sm*. (=Phyllanthus discoideus)	s	
Phyllanthus myrtaceus *Sond*.		
Phyllanthus nummulariifolius *Poir*. var. capillaris *(Schumach.& Thonn.) Radcl.-Sm*.	h	C
Ricinus communis *L*.	h	C
Sapium ellipticum *(Krauss) Pax*		
Suregada procera *(Prain) Croizat*		
Tragia benthamii *Baker*	h	W
Uapaca sansibarica *Pax*	t	W
Uapaca lissopyrena *Radcl.-Sm.* (=U. sp. no. 1)	t	F
Flacourtiaceae		
Aphloia theiformis *(Vahl) Benn.*	t	F
Dovyalis macrocalyx *(Oliv.) Warb.*	s	F
Flacourtia indica *(Burm.f.) Merr*.	s	W
Gerrardina eylesiana *Milne-Redh.*	s	F
Rawsonia lucida *Harv.& Sond.*	t	F
Scolopia stolzii *Gilg*		
Trimeria grandifolia *(Hochst.) Warb.*	t	F
Gesneriaceae		
Streptocarpus eylesii *S.Moore* subsp. eylesii	h	
Streptocarpus grandis *N.E.Br*. subsp. septentrionalis	h	
Streptocarpus michelmorei *B.L.Burtt*	h	
Hamamelidaceae		
Trichocladus ellipticus *Eckl.& Zeyh.* subsp. malosanus *(Baker) Verdc.*	t	F
Hydrostachyaceae		
Hydrostachys polymorpha *Klotzsch*	h	W
Icacinaceae		
Apodytes dimidiata *Arn.*	t	F
Cassinopsis tinifolia *Harv*.	s	F
Pyrenacantha kirkii *Baill*.	cl	F
Rhaphiostylis beninensis *(Planch.) Benth.*		F
Lamiaceae (Labiatae)		
Haumaniastrum villosum *(Benth.) A.J.Paton* (=Acrocephalus callianthus)		
Hoslundia opposita *Vahl*		
Hyptis spicigera *Lam.*	h	C
Leucas milanjiana *Gürke*		
Ocimum gratissimum *L.* subsp. gratissimum (=O. urticifolium)		
Plectranthus guerkei *Briq.* (=Neohyptis paniculata)	H	W
Plectranthus sanguineus *Britten*		
Plectranthus swynnertonii *S.Moore*		
Syncolostemon flabellifolius *(S.Moore) A.J.Paton* (=Hemizygia flabellifolia)		
Tetradenia multiflora *(Benth.) Phillipson* (=Iboza multiflora)		
Lauraceae		
Cassytha filiformis *L*.	h	C
Cryptocarya liebertiana *Engl*.		
Persea americana *Miller*	t	C
Leguminosae: Caesalpinioideae		
Brachystegia microphylla *Harms*	t	W

Brachystegia spiciformis *Benth.*	t	W
Chamaecrista mimosoides *(L.) Greene* (=Cassia mimosoides)	h	C
Chamaecrista poytricha *(Brenan) Lock* (=Cassia polytricha)	h	
Cordyla africana *Lour.*	t	
Erythrophleum suaveolens *(Guill.& Perr.) Brenan*	t	F
Piliostigma thonningii *(Schum.) Milne-Redh.*	t	W
Senna obtusifolia *(L.) Irwin & Barneby* (=Cassia obtusifolia)	h	C
Senna occidentalis *(L.) Link*	h	C
Senna petersiana *(Bolle) Lock*	s	C
Senna septrionalis *(Viv.) Irwin & Barneby*	h	C
Leguminosae: Mimosoideae		
Acacia pentagona *(Schum.) Hook.f.*	cl	F
Acacia schweinfurthii *Brenan & Exell*	cl	W
Albizia adianthifolia *(Schum.) W.Wight*	t	F
Albizia glaberrima *(Schum.& Thonn.) Benth.*	t	F
Albizia gummifera *(J.F.Gmel.) C.A.Sim*	t	F
Entada pursaetha *DC.*	cl	F
Newtonia buchananii *(Baker) G.Gilbert & Boutique*	t	F
Leguminosae: Papilionoideae		
Abrus pulchellus *Thwaites* subsp. tenuiflorus *(Benth.) Verdc.*	cl	W
Aeschynomene nodulosa *(Baker) Baker f.*	h	W
Alysicarpus rugosus *(Willd.) DC.*	h	C
Angylocalyx sp.		
Crotalaria caudata *Baker*	h	C
Crotalaria chirindae *Baker f.*	h	W
Crotalaria gazensis *Baker f.* subsp. gazensis	h	W
Crotalaria lachnophora *A.Rich.*	h	C
Crotalaria lanceolata *E.Mey.* subsp. prognatha *Polhill*	h	C
Dalbergia boehmii *Taub.*	t	W
Dalbergia lactea *Vatke*		
Desmodium salicifolium *(Poir.) DC.*	h	W
Desmodium setigerum *(E.Mey.) Harvey*	h	W
Dolichos trilobus *L.* subsp. trilobus (=D. falcatus)		
Erythrina lysistemon *Hutch.*		
Flemingia grahamiana *Wight & Arn.*		
Glycine wightii *(Wight & Arn.) Verdc.* subsp. wightii		
Indigofera cecilii *N.E.Br.*		
Indigofera hirsuta *L.*	h	C
Indigofera lobata *J.B.Gillett*		
Indigofera lupatana *Baker f.*		
Indigofera lyallii *Baker* subsp. lyallii		
Indigofera richardsiae *J.B.Gillett*	h	C
Indigofera swaziensis *Bolus*	h	W
Indigofera trita *L.f.*	h	C
Millettia stuhlmannii *Taub.*	t	W F
Mucuna pruriens *(L.) DC.* var. pruriens	cl	C
Pterocarpus angolensis *DC.*	t	W
Rhynchosia caribaea *(Jacq.) DC.*	h	C

Rhynchosia stipata *Meikle*	h	
Sesbania macrantha *Phill.& Hutch.* var. levis *Gillett*	h	C
Tephrosia aequilata *Baker*		
Tephrosia longipes *Meissner*		
Teramnus labialis *(L.f.) Spreng.*	h	C
Vigna unguiculata *(L.) Walp.*		
Lobeliaceae		
Lobelia cobaltica *S.Moore*	h	W
Lobelia erinus *L.* (=L. filiformis)	h	C
Lobelia fervens *Thunb.* subsp. fervens (=L. anceps)	h	C
Lobelia goetzei *Diels* (=L. chamaedryfolia)	h	C
Loganiaceae		
Anthocleista grandiflora *Gilg*	t	F
Nuxia oppositifolia *(Hochst.) Benth.*	t	W
Strychnos angolensis *Gilg*	cl	F
Strychnos henningsii *Gilg*	t	F
Strychnos innocua *Delile*	t	W
Strychnos madagascariensis *Poir.*	t	W
Loranthaceae		
Englerina oedostemon *(Danser) Polhill & Wiens* (=Loranthus pungwensis)	e	
Englerina swynnertonii *(Sprague) Polhill & Wiens* (=Loranthus swynnertonii)	e	
Tapinanthus dependens *(Engl.) Danser* (=Loranthus guttatus)	e	W
Viscum shirense *Sprague*	e	
Lythraceae		
Nesaea radicans *Guill.& Perr.*	h	W
Malvaceae		
Hibiscus altissimus *Hornby*	cl	W
Hibiscus burtt-davyi *Dunkley*	t	W
Hibiscus calyphyllus *Cav.*	h	W
Hibiscus micranthus *L.f.*	s	C
Hibiscus physaloides *Guill.& Perr.*	h	C
Hibiscus rostellatus *Guill.& Perr.*	h	W
Hibiscus shirensis *Sprague & Hutch.*	h	W
Hibiscus surattensis *L.*	h	C
Sida acuta *Burm.f.*	h	C
Sida alba *L.*	h	C
Sida serratifolia *Wilczek & Stey.*	h	W
Sida urens *L.*	h	C
Sida veronicifolia *Lam.*	h	C
Urena lobata *L.*	h	C
Wissadula rostrata *(Schum.) Hook.f.*	h	C
Melastomataceae		
Dissotis princeps *(Kunth) Triana*	h	W
Dissotis pulchra *A.& R.Fern.*	h	W
Dissotis rotundifolia *(Sm.) Triana* var. prostrata *(Thonn.) Jacques-Félix*	h	W
Dissotis senegambiensis *(Guill.& Perr.) Triana* var. senegambiensis	h	W
Memecyclon sansibaricum *Taub.*		
Tristemma mauritianum *J.F.Gmel.* (=T. incompletum)	h	F

Meliaceae		
Ekebergia capensis *Sparrm.*	t	
Khaya anthotheca *(Welw.) C.DC.* (=K. nyasica)	t	F,W
Trichilia emetica *Vahl*	t	W,C
Melianthaceae		
Bersama abyssinica *Fresen.*	t	F
Bersama swynnertonii *E.G.Baker*	t	F
Menispermaceae		
Cissampelos mucronata *A.Rich.*	cl	W
Cissampelos torulosa *Harv.*	cl	F
Moraceae		
Dorstenia psilurus *Welw.*	h	
Ficus bubu *Warb.*	t	
Ficus capreifolia *Delile*	s	
Ficus craterostoma *Mildbr.& Burret*		
Ficus natalensis *Hochst.* subsp. natalensis	t	W
Ficus exasperata *Vahl*	t	
Ficus lutea *Vahl* (=F. vogelii)	t	
Ficus muelleriana *C.C.Berg*	t	F
Ficus sur *Forssk.*	t	W
Ficus vallis-choudae *Delile*	t	F
Ficus vogeliana *(Miq.) Miq.*	t	F
Milicia excelsa *(Welw.) C.C.Berg* (=Chlorophora excelsa)	t	F
Trilepisium madagascariense *DC.* (=Bosqueia phoberos)	t	F
Myrsinaceae		
Embelia schimperi *Vatke*	s	W
Rapanea melanophloeos *(L.) Mez*	t	F
Myrtaceae		
Eugenia capenss *(Eckl.& Zey.) Sond.* subsp. nyassensis *(Engl.) F.White* (=E. bukobensis, E. chirindensis)	s	F
Psidium guajava *L.*	t	C
Syzygium gerrardii *(Hook.f.) Burtt Davy*	t	F
Syzygium guineense *(Willd.) DC.* subsp. guineense	t	W
Syzygium owariense *(Beauv.) Benth.*	t	F
Nymphaeaceae		
Nymphaea nouchali *Burm.f.* var. caerulea *(Savigny) Verdc.* (=N. caerulea)	h	W
Ochnaceae		
Brackenridgea zanguebarica *Oliv.*	s	W
Ochna arborea *DC.*	s	F
Ochna atropurpurea *DC.*	s	
Ochna mossambicensis *Klotzsch*	s	W
Ochna natalitia *(Meissner) Walp.*		
Ochna oconnori *Phillips*	s	F
Oleaceae		
Schrebera alata *(Hochst.) Welw.*	t	W
Onagraceae		
Ludwigia abyssinica *A.Rich.*	h	W
Ludwigia octovalvis *(Jacq.) Raven* subsp. octovalvis	h	C

Oxalidaceae		
Biophytum petersianum *Klotzsch*	h	W
Oxalis corniculata *L.*	h	C
Oxalis semiloba *Sond.* subsp. semiloba	h	W
Passifloraceae		
Adenia gummifera *(Harv.) Harms* var. gummifera	cl	W
Basanthe triloba *(Bolus) de Wilde* (=Tryphostemma schinzianum)	h	W
Pedaliaceae		
Sesamum indicum *L.*	h	C
Piperaceae		
Peperomia rotundifolia *(L.) Kunth.*	cl	F
Piper umbellatum *L.*	cl	F
Polygalaceae		
Polygala gazensis *Baker f.*	s	W
Polygala producta *N.E.Br.*	h	C
Polygala rehmannii *Chod.*	h	W
Polygala uncinatus *Meisn.*	h	W
Polygala virgata *Thunb.* var. decora *(Sond.) Harv.*	s	W
Polygonaceae		
Persicaria decipiens *(R.Br.) K.L.Wilson* (=Polygonum salicifolium)	h	W
Rumex sagittatus *Thunb.*	h	W
Primulaceae		
Anagallis barbata *(P.Taylor) Kupicha*	h	W
Proteaceae		
Faurea forficuliflora *Baker*		
Leucospermum saxosum *S.Moore*		
Protea caffra *Meisn.* subsp. gazensis *(Beard) Chisumpa & Brummitt* (=P. gazensis)		
Protea wentzeliana *Engl.* (=P. crinita)		
Ranunculaceae		
Clematis brachiata *Thunb.*	cl	W
Clematis viridiflora *Bertol.*	cl	W
Ranunculus multifidus *Forssk.*	h	C
Rhamnaceae		
Gouania longespicata *Engl.*	cl	F
Rhizophoraceae		
Cassipourea gummiflua *Tul.* var. verticillata *(N.E.Br.) J.Lewis*	t	F
Cassipourea malosana *(Baker) Alston* (=C. congoensis)	t	F
Rosaceae		
Prunus africana *(J.D.Hook.) Kalkman*	t	F
Rubus rigidus *J.E.Sm.*	s	W
Rubiaceae		
Aidia micrantha *(K.Schum.) F.White*	t	F
Anthospermum herbaceum *L.f.*	h	W
Anthospermum usambarense *K.Schum.*	s	
Aulacocalyx diervilleoides *(K.Schum.) Petit*	t	F
Breonadia salicina *(Vahl) Hepper & Wood* (=Adina microcephala)	t	F
Canthium inerme *(L.f.) Kuntze* (=C. ventosum)	s	F
Canthium ngonii *Bridson* (=C. pseudoverticillatum)	s	F

Catunaregum obovata *(Hochst.) A.E.Gonç.* (=Xeromphis obovata)		
Cephalanthus natalensis *Oliv.*	cl	W
Chasallia parvifolia *K.Schum.*	s	F
Chazaliella abrupta *(Hiern) Petit & Verdc.* (=Psychotria abrupta)	s	W
Craterispermum schweinfurthii *Hiern* (=C. laurinum)	s	F
Cremaspora triflora *(Thonn.) K.Schum.*	s	F
Diodia sarmentosa *Sw.* (=D. scandens)	h	F
Fadogia tetraquetra *K.Krause* var. grandiflora *(Robyns) Verdc.* (=F. variabilis)	h	C
Galium bussei *K.Schum.& K.Krause*	h	W
Galopina circaeoides *Thunb.*	h	W
Gardenia imperialis *K.Schum.*		
Geophila obvallata *(Schumach.) F.Didr.* subsp. ioides *(K.Schum.) Verdc.* (=G. ioides)	h	W
Geophila repens *(L.) I.M.Johnstone*	h	F
Keetia gueinzii *(Sond.) Bridson* (=Canthium gueinzii)	cl	F
Keetia venosa *(Oliv.) Bridson* (=Canthium venosum)	cl	F
Leptactina benguelensis *(Benth.& Hook.f.) R.D.Good*		
Leptactina sp.	h	W
Mussaenda arcuata *Poir.*		
Oldenlandia affinis *(Roem.& Schult.) DC.* subsp. fugax *(Vatke) Verdc.*	h	W
Oldenlandia echinulosa *K.Schum.*	h	W
Oldenlandia goreensis *(DC.) Summerh.*	h	W
Oldenlandia herbacea *(L.) Roxb.* var. herbacea	h	C
Oldenlandia rupicola *(Sond.) O.Kuntze* var. rupicola	h	W
Otiophora lanceolata *Verdc.*	h	W
Otomeria elatior *(DC.) Verdc.*	h	W
Oxyanthus lepidus *S.Moore* (=O. oxycarpus)		
Oxyanthus pallidus *Hiern*		
Oxyanthus speciosus *DC.* subsp. stenocarpus *(K.Schum.) Bridson*	s	F
Pentas nobilis *S.Moore*	h	W
Pentas purpurea *Oliv.*	h	W
Pentas zanzibarica *(Klotzsch) Vatke* (=P. zanzibarica var. pembensis)	h	F
Psychotria capensis *(Eckl.) Vatke* var. capensis	s	F
Psychotria peduncularis *(Salisb.) Steyerm.* var. nyassana *(Krausse) Verdc.* (=Cephaelis peduncularis)	s	W
Psychotria zombamontana *(Kuntze) Petit*	s	F
Psydrax kraussioides *(Hiern) Bridson* (=Canthium henriquesianum)	cl	F
Rothmannia manganjae *(Hiern) Keay*		
Rutidea fuscescens *Hiern*		
Rutidea parviflora *DC.* (=R. syringoides)		
Rytigynia umbellulata *(Hiern) Robyns* (=R. sparsifolia)	s	F
Sericanthe andongensis (Hiern) Robbr. (=Tricalysia andongensis)		
Tarenna pavettoides *(Harvey) T.R.Sim* subsp. affinis *(K.Schum.) Bridson*	s	F
Tricalysia coriacea *(Benth.) Hiern* (=T. nyassae)	s	F
Tricalysia pallens *Hiern* (=T. capensis)	s	F
Tricalysia ruandensis *Bremek.* (=T. congesta)		
Tricalysia sp. (cf. T. ligustrina)		
Vangueria infausta *Burch.*	s	W,C
Rutaceae		
Citrus limon *(L.) Burm.f.*	t	C

Clausena anisata *(Willd.) Benth.*	s	F
Teclea nobilis *Delile*	s	F
Toddalia asiatica *(L.) Lam.*	cl	W
Vepris drummondii *Mendonça*	s	F
Santalaceae		
Thesium chimanimaniensis *Brenan*		
Thesium gracile *A.W.Hill*		
Sapindaceae		
Allophylus chaunostachys *Gilg*	s	F
Aporrhiza nitida *Milne-Redh.*	t	F
Blighia unijugata *Baker*	t	F
Filicium decipiens *(Wight & Arn.) Thwaites*		
Glenniea africana *(Radlk.) Leeuh.*		F
Pancovia golungensis *(Hiern) Exell & Mend.*	t	F
Paullinia pinnata *L.*	cl	F
Zanha golungensis *Hiern*	t	F
Sapotaceae		
Afrosersalisia kassneri *(Engl.) J.H.Hemsley*	t	F
Englerophytum magalismontanum *(Sond.) T.D.Penn.* (=Bequaertiodendron magalismontanum)	t	F W
Manilkara discolor *(Sond.) J.H.Hemsley*	t	
Mimusops zeyheri *Sond.*	t	W
Pachystela brevipes *(Baker) Engl.*	t	F
Synsepalum kassneri *(Engl.) Pennington* (=Tulestea wildii)	t	F
Scrophulariaceae		
Buchnera hispidula *D.Don* (=B. longifolia)		
Cycnium adonense *Benth.*		
Halleria lucida *L.*	s	
Lindernia whytei *Skan*		
Striga asiatica *(L.) Kuntze*	h	
Teedia lucida *(Solander) Rudolphi*		
Torenia thouarsii *(Cham.& Schelect.) Kuntze*	h	W
Solanaceae		
Capsicum frutescens *L.*	h	C
Physalis peruviana *L.*	h	C
Solanum americanum *Mill.* (=S. nigrum)	h	C
Solanum indicum *L.*	s	C
Solanum panduriforme *E.Mey.*		
Solanum terminale *Forssk.*		
Sterculiaceae		
Hermannia kirkii *Mast.*	h	C
Thymelaeaceae		
Peddiea africana *Harv.*	s	F
Synaptolepis kirkii *Oliv.* (=S. alternifolia)		
Tiliaceae		
Corchorus aestuans *L.*	h	C
Corchorus olitorius *L.*	h	C
Corchorus trilocularis *L.*	h	C
Triumfetta pilosa *Roth* var. glabrescens *Sprague & Hutch.*	h	C

Triumfetta rhomboidea *Jacq.*	h	C
Triumfetta tomentosa *Boj*.	h	C
Ulmaceae		
Celtis africana *Burm.f.*	t	W
Celtis gomphophylla *Baker*	t	F
Trema orientalis *(L.) Blume*	t	F
Urticaceae		
Boehmeria macrophylla *Hornem*. (=B. platyphyla)		
Urera trinervis *(Hochst.) Friis & Immelman* (=U. cameroonensis)	cl	F
Verbenaceae		
Clerodendrum cephalanthum *Oliv.* subsp. swynnertonii *(S.Moore) Verdc.* (=C. swynnertonii		
Clerodendrum incisum *Klotzsch*	s	F
Lantana camara *L.*		
Lantana trifolia *L.*	s	W
Lippia javanica *(Burm.f.) Spreng.*		
Priva flabelliformis *(Moldenke) R.Fern.* (=P. cordifolia)		
Rotheca myricoides *(Hochst.) Steane & Mabb.* (=Clerodendrum myricoides)		
Vitex amboniensis *Gürke*		
Vitex buchananii *Gürke* (=V. volkensii)		
Vitex doniana *Sweet*	t	F
Vitex payos *(Lour.) Merr.*		
Violaceae		
Rinorea arborea *Thouars*		
Rinorea convallarioides *(E.G.Baker) Eyles*	t	F
Rinorea elliptica *(Oliv.) Kuntze*	s	F
Rinorea ferruginea *Engl*. (=R. gazensis)	t	F
Rinorea ilicifolia *(Oliv.) Kuntze*	t	F
Vitaceae		
Ampelocissus africana *(Lour.) Merr.*	cl	W
Ampelocissus obtusata *(Baker) Planch.* subsp. kirkiana *(Planch.) Wild & Drummond*	cl	W
Cayratia gracilis *(Guill.& Perr.) Suesseng.*	cl	C
Cissus integrifolia *(Baker) Planch.*	cl	W
Cissus petiolata *Hook.f.*	cl	F
Cissus producta *Afzel*.	cl	F
Cyphostemma masukuense *(Baker) Desc*.	cl	F
Cyphostemma montanum *Wild & Drummond*	cl	W
Cyphostemma subciliatum *(Baker) Desc.*	cl	
Rhoicissus tomentosa *(Lam.) Wild & Drummond*	cl	F

ANNEX 4. RANGE-RESTRICTED PLANT SPECIES ASSOCIATED WITH THE CHIMANIMANI MOUNTAINS.

List of Chimanimani endemic and near-endemic plant species, with indication of which part it is endemic to and Red List conservation assessment. Source: adapted and updated from Annex 2 in Timberlake *et al.* (2016b) and Wursten *et al.* (2017). Nomenclature is not fuly compatible with that used in Annex 3.

Endemism: E = endemic, confined solely to Chimanimani Mts
E-low = endemic to lowland areas (± 600 m)
NE = near-endemic, i.e. not confined to Chimanimani Mts but also found in immediately adjacent areas
UMK = Umkondo sandstone endemic (non-Chimanimani Mts)

Taxon	Endemism	IUCN assessment
GYMNOSPERMS		
Zamiaceae		
Encephalartos chimanimaniensis *R.A.Dyer & I.Verd.*	UMK	EN B1ab(i,ii,iv,v) +2ab(i,ii,iv,v), C1
MONOCOTYLEDONS		
Asparagaceae		
Asparagus chimanimaniensis *Sebsebe*	E	LC
Chlorophytum pygmaeum *(Weim.) Kativu* subsp. rhodesianum *(Rendle) Kativu*	NE	
Eriospermum mackenii *Hook.f.* subsp. phippsii *(Wild) P.C.Perry*	E	
Sansevieria pedicellata *la Croix*	E	
Asphodelaceae		
Aloe ballii *Reynolds* var. ballii	E-low	VU D2
Aloe ballii *Reynolds* var. makurupiniensis *A.Ellert*	E-low	VU D2
Aloe hazeliana *Reynolds* var. hazeliana	E	LC
Aloe hazeliana *Reynolds* var. howmanii *(Reynolds) S.Carter*	E	LC
Aloe munchii *Christian*	E	LC
Aloe musapana *Reynolds*	NE	VU D2
Aloe plowesii *Reynolds*	E	VU D2
Aloe wildii *(Reynolds) Reynolds*	E	LC
Eriocaulaceae		
Mesanthemum africanum *Moldenke*	E	LC
Iridaceae		
Gladiolus juncifolius *Goldblatt*	E	
Hesperantha ballii *Wild*	E	LC
Orchidaceae		
Angraecum chimanimaniense *G.Will.*	E	
Disa chimanimaniensis *(H.P.Linder) H.P.Linder*	E	
Oligophyton drummondii *H.P.Linder & G.Will.*	E	
Schizochilus calcaratus *P.J.Cribb & la Croix*	E	
Schizochilus lepidus *Summerh.*	NE	
Poaceae		
Danthoniopsis chimanimaniensis *(J.B.Phipps) Clayton*	E	EN B1ab(iii)+2ab(iii)

Taxon	Endemism	IUCN assessment
Eragrostis desolata *Launert*	E	LC
Restionaceae		
Platycaulos (Restio) quartziticola *(H.P.Linder) H.P.Linder & C.R.Hardy*	E	LC
Velloziaceae		
Xerophyta argentea *(Wild) L.B.Smith & Ayensu*	E	LC
Xyridaceae		
Xyris asterotricha *Lock*	E	VU D2
Xyris sp. ?nov.	E	
DICOTYLEDONS		
Apiaceae		
Centella obtriangularis *Cannon*	E	VU D2
Apocynaceae		
Asclepias graminifolia *(Wild) Goyder*	E	LC
Aspidoglossum glabellum *Kupicha*	NE	
Ceropegia sp. nov. near C. linearis	E	
Raphionacme chimanimaniana *Venter & R.L.Verh.*	E	EN B2ab(iii)
Asteraceae		
Anisopappus paucidentatus *Wild*	E	LC
Aster chimanimaniensis *Lippert*	E	DD
Gutenbergia westii *(Wild) Wild & G.V.Pope*	NE	VU B1ab(iii)+2ab(iii)
Helichrysum africanum *(S.Moore) Wild*	E	LC
Helichrysum maestum *Wild*	E	
Helichrysum moorei *Staner* (= H. spenceranum *Wild*)	E	LC
Helichrysum rhodellum *Wild*	NE	
Lopholaena sp. nov.	E	
Senecio aetfatensis *B.Nord.*	E	LC
Vernonia muelleri *Wild* subsp. muelleri	E-low	
Vernonia nepetifolia *Wild*	E	
Balsaminaceae		
Impatiens salpinx *Schulze & Launert*	E	VU D2
Campanulaceae		
Lobelia cobaltica *S.Moore*	E	LC
Caryophyllaceae		
Dianthus chimanimaniensis *S.S.Hooper*	E	VU D2
Crassulaceae		
Kalanchoe velutina *Britten* subsp. chimanimaniensis *(R.Fern.) R.Fern.*	E	
Ebenaceae		
Diospyros sp. 2 of FZ	NE	
Ericaceae		
Erica lanceolifera *S.Moore*	NE	VU B1ab(iii)+2ab(iii)
Erica pleiotricha *S.Moore* var. blaerioides *(Wild) R.Ross*	NE	NT
Erica pleiotricha *S.Moore* var. pleiotricha	NE	VU D2
Erica wildii *Brenan*	E	LC
Euphorbiaceae		
Euphorbia rugosiflora *L.C.Leach*	E	EN D

Gesneriaceae		
Streptocarpus acicularis *I.Darbysh. & Massingue*	E-low	CR B2ab(iii)
Streptocarpus grandis *N.E.Br.* subsp. septentrionalis *Hilliard & B.L.Burtt*	NE	
Streptocarpus michelmorei *B.L.Burtt*	NE	
Streptocarpus montis-bingae *Hilliard & B.L.Burtt*	E	DD
Streptocarpus sp. nov. near S. grandis	E	
Lamiaceae		
Aeollanthus viscosus *Ryding*	E	LC
Plectranthus caudatus *S.Moore*	NE	VU D2
Syncolostemon flabellifolius (S.Moore) A.J.Paton	E	LC
Syncolostemon oritrephes *(Wild) D.F.Otieno*	E	VU D2
Syncolostemon ornatus *(S.Moore) D.F.Otieno*	NE	VU B1ab(iii)+2ab(iii)
Syncolostemon sp. nov. near S. teucrifolius	E	
Leguminosae: Papilionoideae		
Aeschynomene aphylla *Wild*	E	VU D2
Aeschynomene chimanimaniensis *Verdc.*	E	LC
Aeschynomene gazensis *Baker f.*	UMK	EN B1ab(iii)+B2ab(iii)
Aeschynomene grandistipulata *Harms*	E	LC
Crotalaria phylicoides *Wild*	E	LC
Indigofera chimanimaniensis *Schrire*	UMK	EN B2ab(iii)
Indigofera sp. nov. near I. chimanimaniensis	E	
Kotschya sp. A of FZ	UMK	
Pearsonia mesopontica *Polhill*	NE	LC
Rhynchosia chimanimaniensis *Verdc.*	NE	EN B1ab(iii)+B2ab(iii)
Rhynchosia stipata *Meikle*	E	LC
Tephrosia chimanimaniana *Brummitt*	NE	LC
Tephrosia longipes *Meisn.* var. drummondii *(Brummitt) Brummitt*	NE	
Tephrosia longipes *Meisn.* var. swynnertonii *(Baker f.) Brummitt*	UMK	
Tephrosia praecana *Brummitt*	UMK	VU B1ab(iii)+2ab(iii)
Linderniaceae		
Crepidorhopalon near C. whytei (= Lindernia flava)	E-low	
Melastomataceae		
Dissotis pulchra *A.& R.Fern.*	E	VU D2
Dissotis swynnertonii *(Baker f.) A.& R.Fern.*	E	VU D2
Moraceae		
Ficus muelleriana *C.C.Berg*	E-low	EN B1ab(iii)+2ab(iii)
Myricaceae		
Morella chimanimaniana *Verdc.& Polhill*	E	
Oleaceae		
Olea chimanimani *Kupicha*	E	LC
Orobanchaceae		
Buchnera chimanimaniensis *Philcox*	NE	LC
Buchnera subglabra *Philcox*	E	VU D2
Passifloraceae		
Basananthe parvifolia *(Baker f.) W.J.de Wilde*	UMK	
Penaeaceae		
Olinia subsp. nov. near O. vanguerioides	E	

Peraceae		
Clutia punctata *Wild*	E	LC
Clutia sessilifolia *Radcl.-Sm.*	E	LC
Phyllanthaceae		
Phyllanthus bernierianus *Müll.Arg.* var. glaber *Radcl.-Sm.*	E	
Proteaceae		
Leucospermum saxosum *S.Moore*	(NE)	
Protea enervis *Wild*	E	VU D2
Rubiaceae		
Empogona sp. nov. near E. congesta	E	
Oldenlandia cana *Bremek.*	E	LC
Otiophora inyangana *N.E.Br.* subsp. parvifolia *(Verdc.) Puff*	E	
Otiophora lanceolata *Verdc.*	E-low	VU B1ab(iii)+2ab(iii)
Rytigynia sp. D of FZ	E	
Sericanthe sp. B (Chimanimani taxon) of FZ	NE	
Rutaceae		
Vepris drummondii *Mendonça*	E?-low	VU B1ab(iii)+2ab(iii)
Santalaceae		
Thesium bundiense *Hilliard*	E	DD
Thesium chimanimaniense *Brenan*	E	LC
Thesium dolichomeres *Brenan*	E	LC
Thesium pygmeum *Hilliard*	E	LC
Sapotaceae		
Synsepalum sp. near S. kaessneri	E-low	
Scrophulariaceae		
Selago anatrichota *Hilliard*	E	LC
Thymelaeaceae		
Struthiola montana *B.Peterson*	E	DD

ANNEX 5. MAMMAL CHECKLIST OF THE CHIMANIMANI MOUNTAINS

Systematic list of mammals recorded from the Chimanimani Mountains and adjacent areas (source: Dutton & Dutton 1975, based on records from Smithers and José Tello). Nomenclature not updated or strictly comparable with Annex 6.

x = observed during Dutton & Dutton fieldwork; P = previous record
M = Mozambique, Z = Zimbabwe

Family / Scientific name	Common name (Port.)	notes
Chrysochloridae		
Cryptomys sp.	Rato-toupeira	
Macroscelididae		
Petrodromus tetradactylus	Musaranho elefante de quatro dedos	
Pteropodidae		
Rousettus aegyptiacus	Morcego frugívoro do Egipto	
Epomophorus wahlbergi	Morcego frugivoso de Wahlberg	
Nycteridae		
Nycteris thebaica	Morcego orelhudo do Egipto	
Nycteris grandis	Morcego orelhudo grande	
Rhinolophidae		
Rhinolophus ferrum-equinum	Morcego ferradura gigante	
Hipposideridae		
Hipposideros caffer	Morcego de nariz enfolhado da Cafraria	
Molossidae		
Tadarida aegyptiaca	Morcego de cauda livre do Egipto	
Vespertilionidae		
Pipistrellus nanus	Morcego das bananeiras	
Lorisidae		
Galago granti	Zemur de Grant	
Galago crassicaudata	Zemur gigante	
Cercopithecidae		
Cercopithecus aethiops	Macaco da Etiopia	xMZ
Cercopithecus albogularis	Macaco de Samango	xM
Papio arsinus	Macaco-cao cinzento	xMZ
Canidae		
Lycaon pictus	Mabeco	P
Canis adustus	Chacal listrado	xZ
Mustelidae		
Mellivora capensis	Ratel	

Viverridae		
Nandinia binotata	Civeta arbórea	
Genetta tigrina	Geneta de malhas grandes	
Mungos mungo	Mangueo listrado	
Rhynchogale melleri	Mangueo de Meller	
Bdeogale crassicauda	Mangueo de cauda tufada	
Herpestes sanguineus	Manguço vermelho de cauda preta	
Hyaenidae		
Crocuta crocuta	Hiena malhada	
Felidae		
Panthera pardus	Leopardo	
Panthera leo	Leão	P
Acinonyx jubatus	Chita	
Elephantidae		
Loxodonta africana	Elefante	xM
Procaviidae		
Procavia capensis	Hirax das rochas	
Pronolague crassicaudatus	Lebre da montanha	
Rhinocerotidae		
Diceros bicornis	Rinoceronte de Zineu	P
Equidae		
Equus burchelli	Zebra de Burchell	P
Suidae		
Potamochoerus porcus	Porco bravo	xM
Phacochoerus aethiopicus	Facoceiro	P
Hippopotamidae		
Hippopotamus amphibius	Hipopótamo	P
Bovidae		
Cephalophus natalensis	Mangul ou Cabrito vermelho	
Cephalophus monticola	Cabrito azul	x M
Sylvicapra grimmia	Cabrito cinzento	xMZ
Oreotragus oreotragus	Cabrito das pedras ou cabrito saltador	xMZ
Kobus ellipsiprymnus	Piva, inhacoso ou namedouro	
Hippotragus niger	Palapala ou palave	xM
Hippotragus equinus	Matagaiça ou palapala cinzenta	
Alcelaphus lichtensteini	Gondonga, Nameriga, Ecoe	P
Tragelaphus scriptus	Imbalala	xM
Tragelaphus strepsiceros	Cudo	
Taurotragus oryx	Elande ou Jacaal	xMZ
Syncerus caffer	Búfalo	xM

Hystricidae		
Hystrix africaeaustralis	Porco espinho	xMZ
Muscardinidae		
Graphiurus murinus	Arganoz arbóreo	
Sciuridae		
Heliosciurus refobrachium	Esquilo de cauda listrada	xM
Paraxerus palliatus	Esquilo vermelho da floresta	
Cricetidae & Muridae		
Subfamily Otomyinae		
Otomys irroratus	Rato das lezírias	
Subfamily Murinae		
Pelomys fallax	Rato de dentes canelados	
Acomys spinosissimus	Rato espinhoso	
Lemniscomys griselda	Rato uniraiado	
Rhabdomys pumilio	Rato multistriado	
Thamnomys dolichurus	Rato da floresta	
Leggada minutiodes	Rato pigmeu	
Praomys natalensis	Rato multimamialdo	
Aethomys chrysophilus	Rato vermelho da savana	
Aethomys namaquensis	Rato das rochas	
Rattus rattus	Rato urbano	
Subfamily Gerbillinae		
Tatera inclusa	Gerboa da Gorongosa	
Subfamilies Dendromurinae, Cricetomyinae & Petromyschinae		
Cricetomys gamianus	Rato gigante	
Dendromus mystacalis	Rato trepador anão	
Saccostomus campestris	Rato bochechudo	

ANNEX 6. MAMMAL CHECKLIST OF LOWER RUSITU VALLEY, ZIMBABWE

The following checklist was compiled by Fenton Cotterill from specimens held at the Natural History Museum, Bulawayo, obtained from collections made in the Haroni-Rusitu area over a number of decades. Source: Fenton Cotterill in Haroni-Rusitu Visitor's Guide (BFA 2000, unpublished). Nomenclature follows Kingdon, J. (1997), Field Guide to African Mammals, Academic Press, and is not the same as that used in Annex 5.

INSECTIVORA (insectivores)	
Macroscelididae	
Petrodromus tetradactylus	Four-toed Elephant-shrew
Elephantulus fuscus	Short-snouted Elephant-shrew
Elephantulus myurus	Rock Elephant-shrew
Soricidae (shrews)	
Crocidura sp.	Musk Shrew
Myosorex cafer	Dark-footed Forest Shrew
Sylvisorex megalura	Climbing Shrew
CHIROPTERA (bats)	
Megachiroptera (fruit bats)	
Epomophorus wahlbergi	Peters's Epauletted Fruit Bat
Rousettus aegyptiacus	Egyptian Fruit Bat
Myonycteris relicta	
PRIMATES	
Cercopithecidae	
Cercopithecus aethiops	Vervet Monkey
Cercopithecus mitis	Samango Monkey
Lorisidae	
Otolemur crassicaudatus	Thick-tailed Bushbaby
Galago moholi	Lesser Bushbaby
Galago granti	Grant's Night-Ape
RODENTIA (rodents)	
Sciuridae (squirrels)	
Heliosciurus mutabilis	Sun Squirrel
Paraxerus palliatus	Red Squirrel
Paraxerus cepapi	Tree Squirrel
Gliridae	
Graphiurus platyops	Rock Dormouse
Graphiurus murinus	Woodland Dormouse
Graphiurus parvus	Lesser Savanna Dormouse
Bathyergidae (molerats)	
Cryptomys hottentotus	Common Molerat

Thryonomyidae (cane-rats)
Thryonomys swinderianus Greater Cane-rat
Thryonomys gregorianus Lesser Cane-rat

Cricetidae (giant rat)
Cricetomys gambianus African Giant Rat

Muridae (rats and mice)
Saccostomus campestris Pouched Mouse
Acomys spinosissimus Spiny Mouse
Dendromus mystacalis Chestnut Climbing Mouse
Mastomys natalensis [*M. coucha*?] Multimammate Mouse
Mus minutoides Pygmy Mouse
Aethomys chrysophilus Red Veld Rat
Pelomys fallax Groove-toothed Mouse
Tatera leucogaster Bushveld Gerbil

CARNIVORA (carnivores)
Mustelidae
Aonyx capensis Cape Clawless Otter
Mellivora capensis Honey Badger
Ictonyx striatus Striped Polecat

Viverridae (mongooses)
Mungos mungo Banded Mongoose
Rhynchogale melleri Meller's Mongoose
Bdeogale crassicaudata Bushy-tailed Mongoose
Paracynictis selousi Selous's Mongoose
Galerella sanguinea Slender Mongoose
Atilax paludinosus Water Mongoose
Ichneumia albicauda White-tailed Mongoose
Genetta tigrina Large-spotted Genet
Civettictis civetta Civet
Nandina binotata Tree Civet

Felidae
Felis sylvestris African Wild Cat
Felis serval Serval

HYRACOIDEA
Procavidae
Procavia capensis Rock Dassie
Heterohyrax brucei Yellow-spotted Rock Dassie

ARTIODACTYLA (even-toed ungulates)
Suidae (pigs and hogs)
Potamochoerus porcus Bushpig

Bovidae (antelopes)
Sylvicapra grimmia Common Duiker
Cephalophus monticola Blue Duiker

ANNEX 7. BIRD CHECKLIST OF THE CHIMANIMANI MOUNTAINS

Checklist of the bird species found on the Chimanimani Mountains with Portuguese common names (sources: C.J. Hodgson 1971 in Dutton & Dutton 1975, with additional montane sight records from H.D. Jackson and T.P. Dutton, and from D.G. Broadley below 600 m altitude).

M = recorded from above 600 m altitude; L = recorded from below 600 m altitude

Scientific name	**Common name (Port.)**	**Alt.**
Podiceps ruficollis	Mergulhão do cabo	M
Phalacrocorax africanus	Corvo-marinho africano	M
Sphenorhynchus abdimii	Cegonha de peito branco	M
Anas sparsa	Pato preto	M
Falco biarmicus	Falcão de coroa acastanhada	M
Falco tinnunculus	Falcão das rochas	M
Milvus aegyptius	Rabo de bacalhau de bico amarelo	M
Elanus caeruleus	Peneireiro de espáduas pretas	M
Aquila verreauxi	Águia preta	M
Lophaetus occipitalis	Águia de polpa	M
Stephanoaetus coronatus	Águia coroada	M
Circaetus cinereas	Guincho castanho	M
Buteo rufofuscus augur	Bútio de peito branco	M
Circus ranivorus ranivorus	Açor dos pântanos	M
Polyboroides typus	Serpentário pequeno	M
Francolinus shelleyi	Francolino de Shelleyi	M
Coturnix coturnix	Codorniz africana	M
Coturnix delegorguei	Codorniz arlequim	M
Numida meleagris	Galinha do mato	M
Sarothrura affinis	Codornizão de cauda avermelhada	M
Afribyx senegallus	Barbilhão	M
Gallinago nigripennis	Narceja da Etiópia	M
Aclitus hypoleucos	Maçarico comum	M
Trinae nebularia	Maçarico cinzento	M
Columba guinea phaeonota	Pombo das rocas	M
Columba arquatrix arquatrix	Pombo de bico amarelo	M
Streptopelia capicola capicola	P.ola de colar	M
Turtur tympanistria	Rola de papo branco	M
Aplopelia larvata larvata	Rola esverdeada	M
Turacus corythaix livingstonii	Toraco de Knysna	M
Cuculus solitarius	Cuco de peito vermelho	M
Centropus superciliosus	Cuco de Burchel	M
Ciccaba woodfordii	Mocho da floresta	M
Glaucidium capense	Mochino barrado	M
Bubo africanus	Corujão	M
Caprimulgue tristigma	Noitibó das rochas	M
Apus barbatus	Andorinhão preto	M
Apus caffer	Andorinhão de rabaldilha branca	M
Colitis striatus	Rabo de junco	M
Apaloderma narina	Republicano	M
Corylhornis cristata	Pica peixe de crista	M
Merops apiaster	Abelharuco da Europa	M

Rhinopomastus cyanomelas	Bico de cimitarra	M
Buccanodon leucotis	Barbaças de orelhas brancas	M
Pogoniulus bilineatus	Barbadinho de rabadilha dourada	M
Indicator indicator	Indicador maior	M
Indicator variegatus	Pássaro do mel	M
Indicator minor	Indicador menor	M
Prodotiscus regulus	Pássaro do mel de garganta branca	M
Campethera cailliautii	Pequeno pica-pau malhado	M
Dendropicos fuscescens	Pica pausinho	M
Smithornis capensis	Bocarra	M
Hirundo albigularis albigularis	Andorinha de garganta branca	M
Hirundo atrocaerulea	Andorinha azul	M
Cecropis cucullata	Andorinha grande listrada	M
Ptynoprogne fuligula rufigula	Andorinha das rochas	M
Delichon urbica urbica	Andorinha das casas	M
Psalidoprocne orientalis orientalis	Andorinha preta de axilas brancas	M
Coracina pectoralis	Lagarteira de peito branco	M
Coracina caesia caesia	Lagarteira cinzento	M
Dicrurus ludwigii ludwigii	Bombeiro de cauda quadrada	M
Oriolus larvatus larvatus	Fapa-figos de cabeça preta	M
Corvultur albicollis	Corvo de pescoço branco	M
Coracina pectoralis	Lagarteira de peito branco	M
Parus rufiventris	Chapim de ventre vermelho	M
Pycnonotus nigricans	Toutinegra de olhos vermelhos	M
Phyllastrephus flavostriatus	Toutinegra de listas amarelas	M
Andropadus milanjensis	Tuta de Milanji	M
Chlorocichla flaviventris	Tuta amarela	M
Turdus libonyanus	Chichario	M
Turdus olivaceus swynnertoni	Tordo de peito azeitonado	M
Turdus gurneyi gurney	Tordo de peito laranja	M
Oenanthe oenanthe oenanthe	Chasco das pedras	M
Cercamela familiaris familiaris	Chasco de cauda castanha	M
Thamnolaea cinnamomeiventris cinnamomeiventris	Chasco de rabadilha e ventre castanhos	M
Saxicola torquala torquata	Chasco de cabeça preta	M
Cossypha heuglini euronota	Cossifa de Heuglini	M
Cossypha cajjra caffra	Cossifa de ventre azul acinzentado	M
Pogonocichla stellata stellate	Tordo estrelado	M
Phylloscopus trochilus trochiltis	Felosa	M
Eremomela scotops scotops	Rouxinol de cabeça verde	M
Bradypterus barratti barratti	Rouxinol dos matagais	M
Schoenicola brevirostris brevirostris	Rouxinol de cauda larga	M
Sphenoeacus afer afer	Rouxinol de dois bigodes	M
Sylvietta rufescens rufescens	Carriça de cauda curta	M
Apalis thoracica thoracica	Apalis de colar preto	M
Apalis chirindensis	Apalis do monte	M
Apalis flavida flavida	Apalis de peito amarelo	M
Camaroptera brachyura brachyura	Rouxinol de costas verdes	M
Cisticola ayresii ayresii	Cisticola de Ayres	M
Cisticola fulvicapilla fulvicapilla	Cisticola de cabeça ruivá	M
Cisticola lais lais	Cisticola choroma	M

Cisticola cantans munzneri	Cisticola cantadora	M
Cisticola natalensis natalensis	Cisticola de Natal	M
Cisticola aberrans aberrans	Cisticola de cauda comprida	M
Prinia robertsi	Prinia de Roberts	M
Prinia subflava affinis	Prinia	M
Muscicapa adusta adusta	Taralhão sombrio	M
Muscicapa cinerea caerulescens	Taralhão azulado	M
Chloropeta natalensis natalensis	Rouxinol amarelo	M
Hyliota australis australis	Papa-moscas da Brachystegia	M
Seicercus ruficapilla ruficapilla	Papa-moscas dc peito amarelo	M
Batis capensis capensis	Batis da floresta	M
Batis molitor molitor	Batis comum	M
Platysteira peltata peltata	Apanha-moscas de carúnculas	M
Trochocercus cyanomelas cyanomelas	Apanha-moscas de crista	M
Trochocercus albonotatus	Papa-moscas de cauda branca	M
Terosiphone viridis granti	Apanha-moscas de paraíso	M
Motacilla aguimp vidua	Alvéola branca e preta	M
Anthus novaeseelandiae rufuloides	Peetinha de Richards	M
Motacilla clara torrentium	Alvéola cinzenta	M
Anthus lineiventris	Petinha listrada	M
Anthus trivialis trivialis	Petinha das árvores	M
Mocronyx croceus vulturnus	Unhas longas	M
Lanius collaris	Picanço branco e preto	M
Lanius collurio	Picanço da Europa	M
Laniarius ferrugineus	Picanço ferugínco	M
Dryoscopus cubla	Picanço de almofadinha branca	M
Tchagra australis	Picanço de cabeça castanha	M
Tchagra senegala	Picanço assobiador	M
Chlorophoneus olivaceas	Picanço oliváceo	M
Chloropohneus nigrifrons	Picanço de fronte preta	M
Telophorus quadricolor	Picanço de quatro cores	M
Telophiorus zeylonus restrictus	Picanço de garganta prétã	M
Prionops plumata	Picanço de poupa branca	M
Sigmodus retzii	Picanço atacador de poupa branca	M
Onychognathus morio morio	Estorninho de asa vermelha	M
Promeropsgurneyi gurneeyi	Ave do néctar de coroa e peito vermelho	M
Nectarinia famosa famosa	Beija-flor malaquite	M
Nectarinia kilimensis arturi	Beija-flor bronzeado	M
Cinnyris chalybeus manoensis	Beija-flor pequeno de duas bandas	M
Cinnyris venustus falkensteini	Beija-flor ventre amarelo	M
Cyanomitra olivacea sclateri	Beija-flor oliváceo	M
Anthreptes collaris collaris	Beija-flor de colar	M
Chalcomitra amethystina amethystina	Beija-flor preto	M
Zosterops senegalensis anderssoni	Olho branco	M
Petronia superciliaris	Pardal de garganta amarela	M
Symplectes bicolor bicolor	Tecelão da floresta	M
Ploceus xanthops	Tecelão dourado grande	M
Euplectes orix orix	Cardeal	M
Coliuspasser capensis transvaalensis	Viúva de costas amarelas	M
Coliuspasser ardens ardens	Viúva de colar vermelho	M
Lonchura bicolor rufodorsalis	Freirinha de costas vermelhas	M

Coccopygia quartinia stuartirwini	Bico de lacre da Africa	M
Cryptospiza reichenowii	Asa vermelha do Niassa	M
Estrilda perreini incana	Bico de lacre cinzento	M
Estrilda astrild astrild	Bico de lacre	M
Vidua macroura	Viuvinha malhada	M
Serius canicollis canicollis	Canário do Cabo	M
Serinus mozambicus mozambicus	Canário de Moçambique	M
Crithagra sulphurata sharpie	Canário de bico grosso	M
Poliospiza gularis gularis	Canário cinzento de cabeça listrada	M
Fringillaria capensis capensis	Trigueirão do Cabo	M

Additional records from H.D. Jackson

Bubo capensis	Corujão	M
Megaceryle maxima maxima	Pica-peixe gigante	M
Alcedo semitorquata seinitorquata	Pica-peixe	M
Prodotiscus insignis zambesiae	Pássaro-do-mel de bico fino	M
Campethera abingoni vibrator	Pica-pau de cauda dourada	M
Parus griseiventris	Chapim de ventre cinzento	M
Pycnonotus barbatus layardi	Toutinegra de olhos pretos	M
Batis soror	Batis de Moçambique	M
Motacilla aguimp aguimp	Alvéola branca e preta	M
Coccopygia melanolis melanotis	Bicos de lacre de garganta preta	M

Additional records from T.P. Dutton

Polemaetus bellicosus	Águia marcial	M
Circaetus pectoralis	Guincho de peito preto	M
Cinnyris afer	Beija-flor grande de duplo colar	M
Euplectes hordeaceus hordeaceus	Cardeal de cabeça vermelha	M

Some rare birds found below 600 m in evergreen forest (source: D.G. Broadley).

Circaetus fasciolatus	Guincho listrado	L
Colemba delagorguei	Pombo de nuca bronzeado	L
Cercococcyx montanus	Cuca de longa cauda listrada	L
Indicator meliphilus		L
Phyllestrephus depilis	Toutinegra pequino	L
Andropadus importunis	Tuta sombria	L
Bias musicus	Papa-moscas preto e branco	L
Prinonops scopifrens	Picanço atacador de fronte amarela	L
Batis fratum	Papa-moscas de peito castanho	L
Lamproternis corruscus	Estorninho de ventre preto	L

ANNEX 8. BIRD CHECKLIST

Checklist of birds recorded from the Chimanimani Mountains above 700 m altitude, from both Zimbabwe and Mozambique (source: Beasley 1995).

Common name	**Scientific name**
Dabchick	*Tachybaptus ruficollis*
Hamerkop	*Scopus umbretta*
Abdim's Stork	*Ciconia abdimii*
Black Duck	*Anas sparsa*
Yellow-billed Kite	*Milvus migrans*
Black-shouldered Kite	*Elanus caeruleus*
Black Eagle	*Aquila verreauxii*
Long-crested Eagle	*Lophaetus occipitalis*
Martial Eagle	*Polemaetus bellicosus*
Crowned Eagle	*Stephanoaetus coronatus*
Brown Snake Eagle	*Circaetus cinereus*
Southern Banded Snake Eagle	*Circaetus fasciolatus*
Augur Buzzard	*Buteo augur*
African Marsh Harrier	*Circus ranivorus*
Gymnogene	*Polyboroides typus*
Lanner Falcon	*Falco biarmicus*
Taita Falcon	*Falco fasciinucha*
Rock Kestrel	*Falco tinnunculus*
Shelley's Francolin	*Francolinus shelleyi*
Red-necked Francolin	*Francolinus afer*
Common Quail	*Coturnix coturnix*
Harlequin Quail	*Coturnix delegorguei*
Helmeted Guineafowl	*Numida meleagris*
Striped Flufftail	*Sarothrura qffinis*
Wattled Plover	*Vanellus senegallus*
Common Sandpiper	*Tringa hypoleucos*
Greenshank	*Tringa nebularia*
Great Snipe	*Gallinago media*
Rock Pigeon	*Columba guinea*
Rameron Pigeon	*Columba arquatrix*
Cape Turtle Dove	*Streptopelia capicola*
Tambourine Dove	*Turtur tympanistria*
Cinnamon Dove	*Aplopelia larvata*
Green Pigeon	*Treron calva*
Knysna Lourie	*Tauraco corythaix*
African Cuckoo	*Ciculus gularis*
Red-chested Cuckoo	*Cuculus solitarius*
Klaas's Cuckoo	*Chrysococcyx klaas*
Burchell's Coucal	*Centropus superciliosus*
Wood Owl	*Strix woodfordii*
Barred Owlet	*Glaucidium capense*
Cape Eagle Owl	*Bubo capensis*
Spotted Eagle Owl	*Bubo africanus*
Freckled Nightjar	*Caprimulgus tristigma*
Pennant-winged Nightjar	*Macrodipteryx vexillaria*

Black Swift	*Apus barbatus*
White-rumped Swift	*Apus caffer*
Scarce Swift	*Schoutedenapus myoptilus*
Speckled Mousebird	*Colius striatus*
Giant Kingfisher	*Ceryle maxima*
Half-collared Kingfisher	*Alcedo semitorquata*
Malachite Kingfisher	*Alcedo cristata*
Brown-hooded Kingfisher	*Halcyon albiventris*
Grey-hooded Kingfisher	*Halcyon leucocephala*
European Bee-eater	*Merops apiaster*
Blue-cheeked Bee-eater	*Merops persicus*
Little Bee-eater	*Merops pusillus*
Hoopoe	*Upupa epops*
Scimitar-billed Wood Hoopoe	*Rhinopomastus cyanomelas*
Black-collared Barbet	*Lybius torquatus*
White-eared Barbet	*Stactolaema leucotis*
Golden-rumped Tinker Barbet	*Pogoniulus bilineatus*
Greater Honeyguide	*Indicator indicator*
Scaly-throated Honeyguide	*Indicator variegatus*
Lesser Honeyguide	*Indicator minor*
Sharp-billed Honeyguide	*Prodotiscus regulus*
Slender-billed Honeyguide	*Prodotiscus zambesiae*
Bennett's Woodpecker	*Campethera bennettii*
Golden-tailed Woodpecker	*Campethera abingoni*
Cardinal Woodpecker	*Dendropicos fuscescens*
White-throated Swallow	*Hirundo albigularis*
Blue Swallow	*Hirundo atrocaerulea*
Greater Striped Swallow	*Hirundo cucullata*
Lesser Striped Swallow	*Hirundo abyssinica*
Rock Martin	*Hirundo fuligula*
House Martin	*Delichon urbica*
Eastern Saw-wing	*Psalidoprocne orientalis*
Black Cuckoo-shrike	*Campephaga flava*
White-breasted Cuckoo-shrike	*Coracina pectoralis*
Grey Cuckoo-shrike	*Coracina caesia*
Fork-tailed Drongo	*Dicrurus adsimilis*
Square-tailed Drongo	*Dicrurus ludwigii*
African Golden Oriole	*Oriolus auratus*
Black-headed Oriole	*Oriolus larvatus*
White-necked Raven	*Corvus albicollis*
Miombo Grey Tit	*Parus griseiventris*
Rufous-bellied Tit	*Parus rufiventris*
Arrow-marked Babbler	*Turdoides jardineii*
Black-eyed Bulbul	*Pycnonotus barbatus*
Yellow-streaked Bulbul	*Phyllastrephus flavostriatus*
Striped-cheeked Bulbul	*Andropadus milanjensis*
Kurrichane Thrush	*Turdus libonyana*
Olive Thrush	*Turdus olivaceus*
Orange Thrush	*Zoothera gurneyi*
Miombo Rockthrush	*Monticola angolensis*
European Wheatear	*Oenanthe oenanthe*

Familiar Chat	*Cercomela familiaris*
Mocking Chat	*Thamnolaea cinnamomeiventris*
Stonechat	*Saxicola torquata*
Heuglin's Robin	*Cossypha heuglini*
Natal Robin	*Cossypha natalensis*
Cape Robin	*Cossypha caffra*
Starred Robin	*Pogonocichla stellata*
Mashona Hyliota	*Hyliota australis*
Icterine Warbler	*Hippolais icterina*
Yellow Warbler	*Chloropeta natalensis*
Barratt's Warbler	*Bradypterus barratti*
Broad-tailed Warbler	*Schoenicola brevirostris*
Willow Warbler	*Phylloscopus trochilus*
Yellow-throated Warbler	*Seicercus ruficapillus*
Bar-throated Apalis	*Apalis thoracica*
Chirinda Apalis	*Apalis chirindensis*
Red-faced Crombec	*Sylvietta whytii*
Green-capped Eremomela	*Erernomela scotops*
Grassbird	*Sphenoeacus afer*
Moustached Warbler	*Melocichla mentalis*
Ayres' Cisticola	*Cisticola ayresii*
Wailing Cisticola	*Cisticola lais*
Singing Cisticola	*Cisticola cantans*
Croaking Cisticola	*Cisticola natalensis*
Lazy Cisticola	*Cisticola aberrans*
Neddicky	*Cisticola fulvicapilla*
Tawny-flanked Prinia	*Prima subflava*
Roberts' Prinia	*Prinia robertsi*
Dusky Flycatcher	*Muscicapa adusta*
Blue-grey Flycatcher	*Muscicapa caerulescens*
Cape Batis	*Batis capensis*
Chinspot Batis	*Batis molitor*
Mozambique Batis	*Batis soror*
White-tailed Crested Flycatcher	*Trochocercus albonotatus*
Paradise Flycatcher	*Terpsiphone viridis*
African Pied Wagtail	*Motacilla aguimp*
Long-tailed Wagtail	*Motacilla clara*
Grassveld Pipit	*Anthus cinnamoneus*
Wood Pipit	*Anthus nyassae*
Striped Pipit	*Anthus lineiventris*
Tree Pipit	*Anthus trivialis*
Yellow-throated Longclaw	*Macronyx croceus*
Lesser Grey Shrike	*Lanius minor*
Fiscal Shrike	*Lanius collaris*
Red-backed Shrike	*Lanius collurio*
Tropical Boubou	*Laniarius aethiopicus*
Puffback	*Dryoscopus cubla*
Black-crowned Tchagra	*Tchagra senegala*
Bokmakierie	*Telophorus zeylonus*
Gorgeous Bush Shrike	*Telophorus quadricolor*
Black-fronted Bush Shrike	*Telophorus nigrifrons*

Olive Bush Shrike	*Telophorus olivaceus*
Grey-headed Bush Shrike	*Malaconotus blanchoti*
White Helmet-Shrike	*Prionops plumatus*
Red-billed Helmet-Shrike	*Prionops retzii*
Amethyst Starling	*Cinnyricinclus leucogaster*
Red-winged Starling	*Onychognathus morio*
Gurney's Sugarbird	*Promerops gurneyi*
Malachite Sunbird	*Nectarinia famosa*
Bronze Sunbird	*Nectarinia kilimensis*
Miombo Double-collared Sunbird	*Nectarinia manoensis*
Yellow-bellied Sunbird	*Nectarinia venusta*
White-bellied Sunbird	*Nectarinia talatala*
Grey Sunbird	*Nectarinia veroxii*
Olive Sunbird	*Nectarinia olivacea*
Black Sunbird	*Nectarinia amethystina*
Yellow White-eye	*Zosterops senegalensis*
Yellow-throated Sparrow	*Petronia superciliaris*
Forest Weaver	*Ploceus bicolor*
Spectacled Weaver	*Ploceus ocularis*
Golden Weaver	*Ploceus xanthops*
Red-billed Quelea	*Quelea quelea*
Red Bishop	*Euplectes orix*
Yellow-rumped Widow	*Euplectes capensis*
Red-collared Widow	*Euplectes ardens*
Red-faced Crimsonwing	*Cryptospiza reichenovii*
Blue-billed Firefinch	*Lagonosticta rubricata*
Jameson's Firefinch	*Lagonosticta rhodopareia*
Common Waxbill	*Estrilda astrild*
Swee Waxbill	*Estrilda quartinia*
Red-backed Mannikin	*Spermestes bicolor*
Pin-tailed Whydah	*Vidua macroura*
Yellow-eyed Canary	*Serinus mozambicus*
Cape Canary	*Serinus canicollis*
Bully Canary	*Serinus sulphuratus*
Streaky-headed Canary	*Serinus gularis*
Black-eared Canary	*Serinus mennelli*
Golden-breasted Bunting	*Emberiza flaviventris*
Cape Bunting	*Emberiza capensis*
Cinnamon-breasted Rock Bunting	*Emberiza tahapisi*

ANNEX 9. BIRD CHECKLIST OF THE LOWER RUSITU VALLEY

This checklist of 262 bird species was compiled by Peter Mundy from various sources, including records from members of BirdLife Zimbabwe (source: Childes & Irwin in BFA 2000, unpublished). Arranged under family following Irwin (1981). This can be treated as complementary to Annex 8.

Habitat:	E = edge of forest	F = within forest	R = found near rivers
	W = woodland	G = grassland/agricultural fields	M = mountains
	where the species occurs in a range of habitats, both are given, e.g. G/R		
Status:	r = resident	sv = summer visitor	wv = winter visitor
(if known)	e = threatened	vu = vulnerable	nt = near threatened
	* = unusual or rare species in Zimbabwe		

species	Common name	habitat	status
Podicipedidae (grebes)			
Tachybaptus ruficollis	Dabchick	R	
Phalacrocoracidae (cormorants)			
Phalacrocorax africanus	Reed Cormorant	R	
Anhinga melanogaster	Darter	R	
Ardeidae (herons, egrets, bitterns)			
Ardea purpurea	Purple Heron	R	
Butorides striatus	Green-backed Heron	R	
Ixobrychus minutus	Little Bittern	R	
Scopus umbretta	Hamerkop	R	
Plateleidae (ibises, spoonbills)			
Bostrychia hagedash	Hadeda Ibis	R/E	
Anatidae (ducks, geese)			
Anas sparsa	African Black Duck	R	r
Accipitridae (raptors)			
Milvus migrans	Yellow-billed Kite	W	sv
Elanus caeruleus	Black-shouldered Kite	G	
Aquila verreauxii	Black Eagle	M	
Aquila nipalensis	Steppe Eagle	M	sv
Hieraaetus ayresii	Ayre's Eagle	W	t
Lophaetus occipatilis	Long-crested Eagle	E	?r
Polemaetus bellicosus	Martial Eagle	W	vu
Stephanoaetus coronarus	Crowned Eagle	F	r, nt
Circaetus cinereus	Brown Snake Eagle	W	
* *Circaetus fasciolatus*	Southern Banded Snake Eagle	E	r, vu
Terathopius ecaudatus	Bateleur	W	vu
Buteo buteo	Steppe Buzzard	F	sv
Buteo augur	Augur Buzzard	M	
Kaupifalco monogrammicus	Lizard Buzzard	W	

species	Common name	habitat	status
Accipiter melanoleucus	Black Sparrow Hawk	E	r
Accipiter badius	Little Banded Goshawk	W	
Accipiter tachiro	African Goshawk	F/W	r
Micronisus gabar	Gabar Goshawk	W	
Polyboroides radiatus	Gymnogene	W	
Falconidiae (falcons, kestrels)			
Falco subbuteo	European Hobby	M	
* *Falco fasciinucha*	Taita Falcon	M	e
Falco amurensis	Eastern Red-footed Falcon	W	
Falco dickinsoni	Dickinson's Kestrel	W	
Phasianidae (francolins, quails)			
Francolinus afer	Red-necked Francolin	E	r
Coturnix delegorguei	Harlequin Quail	G	
Coturnix adansonii	Blue Quail	G	
Numididae (guineafowl)			
Guttera pucherani	Crested Guineafowl	E	r
Numida meleagris	Helmeted Guineafowl	G	
Turnicidae (button-quail)			
Turnix sylvatica	Kurrichane Button-quail	G	
Rallidae (rails, crakes, coots)			
Amaurornis flavirostris	Black Crake	R	
Sarothrura rufa	Red-chested Flufftail	G	
Sarothrura elegans	Buff-spotted Flufftail	F	?sv
Heliornithidae (finfoots)			
Podica senegalensis	African Finfoot	R	?r, vu
Scolopacidae (sandpipers, snipes)			
Tringa hypoleucos	Common Sandpiper	R	sv
Columbidae (pigeons, doves)			
Columba guinea	Speckled Rock Pigeon	M	
Columba arquatrix	Rameron Pigeon	F	
Columba delegorguei	Delegorgue's Pigeon	F	r, vu
Streptopelia semitorquata	Red-eyed Dove	W	
Streptopelia capicola	Cape Turtle Dove	W	
Turtur afer	Blue-spotted Wood Dove	F	r
Turtur tympanistra	Tambourine Dove	F	r
Aplopelia larvata	Cinnamon Dove	F	?wv
Treron australis	African Green Pigeon	F	

Musophagidae (louries, turacos)			
Tauraco persa	Green Lourie	F	r
Gallirex porphyreolophus	Purple-crested Lourie	W	
Cuculidae (cuckoos, coucals)			
Cuculus gularis	African Cuckoo	W	sv
Cuculus poliocephalus	Lesser Cuckoo	F	sv
Cuculus solitarius	Red-chested Cuckoo	F	sv
Cuculus clamosus	Black Cuckoo	E	sv
* *Cercococcyx montanus*	Barred long-tailed Cuckoo	F	sv
Pachycoccyx audeberti	Thick-billed Cuckoo	E	wv
Chrysococcyx cupreus	Emerald Cuckoo	F	sv
Chrysococcyx klaas	Klaas' Cuckoo	E	sv
Chrysococcyx caprius	Diederik Cuckoo	W	sv
Ceuthmochares aereus	Green Coucal	F	r
Centropus superciliosus	Burchell's Coucal	G/E	r
Tytonidae (barn & grass owls)			
Tyto alba	Barn Owl	W	
Strigidae (typical owls)			
Strix woodfordii	Wood Owl	F	r
Glaucidium capense	Barred Owl	R	
Bubo africanus	Spotted Eagle Owl	W	
Scotopelia peli	Pel's Fishing Owl	R	?r, vu
Caprimulgidae (nightjars)			
Caprimulgus europaeus	European Nightjar	W	sv
Caprimulgus pectoralis	Fiery-necked Nightjar	W	
Caprimulgus tristigma	Freckled Rock Nightjar	M	
Apodidae (swifts)			
Apus aequatorialis	Mottled Swift	M	
* *Schoutedenapus myoptilus*	Scarce Swift	M	
Cypsiurus parvus	African Palm Swift	R	
Telacanthura ussheri	Mottled Spinetail	E	
Neafrapus boehmi	Bohm's Spinetail	E	
Coliidae (mousebirds)			
Colius striatus	Speckled Mousebird	E	r
Trogonidae (trogons)			
Apaloderma narina	Narina Trogon	F	r
Alcedinidae (kingfishers)			
Ceryle maxima	Giant Kingfisher	R	r
Alcedo semitorquata	Half-collared Kingfisher	R	r, nt

Corythornis cristata	Malachite Kingfisher	R	
Ceyx picta	Pygmy Kingfisher	F	sv
Halcyon albiventris	Brown-hooded Kingfisher	E	r
Halcyon leucocephala	Chestnut-bellied Kingfisher	W	sv
Halcyon chelicuti	Striped Kingfisher	W	
Meropidae (bee-eaters)			
Merops apiaster	European Bee-eater	W	sv
Merops superciliosus	Blue-cheeked Bee-eater	W	sv
Merops pusillus	Little Bee-eater	G/R	
Merops hirundineus	Swallow-tailed Bee-eater	G	
Coraciidae (rollers)			
Coracias caudata	Lilac-breasted Roller	W	
Eurystomus glaucurus	Cinnamon Roller	W/E	sv
Phoeniculidae (woodhoopoes)			
Phoeniculus purpureus	Red-billed Woodhoopoe	W	
Phoeniculus cyanomelas	African Scimitarbil	W	
Bucerotidae (hornbills)			
Bycanistes bucinator	Trumpeter Hornbill	F	
* *Bycanistes brevis*	Silvery-cheeked Hornbill	F	r
Tockus alboninatus	Crowned Hornbill	W/E	r
Capitonidae (barbets)			
Stactolaema leucotis	White-eared Barbet	F	r
Pogoniulus bilineatus	Golden-rumped Tinker Barbet	F	r
Indicatoridae (honeyguides)			
Indicator indicator	Greater Honeyguide	W	
Indicator variegatus	Scaly-throated Honeyguide	F	r
Indicator minor	Lesser Honeyguide	E	r
* *Indicator meliphilus*	Eastern Least Honeyguide	F	?r
Prodotiscus zambesiae	Slender-billed Honeyguide	W	
Picidae (woodpeckers)			
Campethera bennettii	Bennett's Woodpecker	W	
Campethera albigoni	Golden-tailed Woodpecker	E	r
* *Campethera cauiliautii*	Little Spotted Woodpecker	E	r
Dendropicos fuscescens	Cardinal Woodpecker	W	
Thripias namaquus	Bearded Woodpecker	W	
Eurylaimidae (broadbills)			
Smithornis capensis	African Broadbill	F	r, nt
Pittidae (pittas)			
Pitta angolensis	Angola Pitta	F	sv

Hirundinidae (swallows, martins)			
Hirundo rustica	European Swallow	G/W	sv
Hirundo smithii	Wire-tailed Swallow	R	
Hirundo senegalensis	Mosque Swallow	W	
Hirundo abyssinica	Lesser Striped Swallow	W	
Hirundo fuligula	African Rock Martin	M	
Delichon urbica	European House Martin	M	sv
Hirundo griseopyga	Grey-rumped Swallow	G	
Riparia paludicola	Brown Sand Martin	R	
Psalidoprocne orientalis	Eastern Roughwing	E	r
Campephagidae (cuckoo-shrikes)			
Campephaga flava	Eastern Black Cuckoo-shrike	W/E	wv
Coracina pectoralis	White-breasted Cuckoo-shrike	W	
Coracina caesia	Grey Cuckoo-shrike	F	?wv
Dicruridae (drongos)			
Dicrurus adsimilis	Fork-tailed Drongo	W	
Dicturus ludwigii	Square-tailed Drongo	F/R	
Oriolidae (old-world orioles)			
Oriolus oriolus	European Golden Oriole	W/E	sv
Oriolus auratus	African Golden Oriole	W/E	wv
Oriolus larvatus	Eastern Black-headed Oriole	W/E	wv
Corvidae (crows)			
Corvus albus	Pied Crow		
Corvus albicollis	White-necked Raven	M	
Paridae (tits)			
Parus niger	Southern Black Tit	W	
Parus rufiventris	Rufous-bellied Tit	W	
Timaliidae (babblers)			
Turdoides jardineii	Arrow-marked Babbler	W/G	
Pycnonotidae (bulbuls)			
Pycnonotus barbatus	Black-eyed Bulbul	W	r
Phyllastrephus terrestris	Terrestrial Bulbul	E	r
Phyllastrephus flavostriatus	Yellow-streaked Bulbul	F	r
Phyllastrephus debilis	Slender Bulbul	F	r
Andropadus importanus	Sombre Bulbul	E	r
Andropadus milanjensis	Striped-cheeked Bulbul	F	wv
Chlorocichla flaviventris	Yellow-bellied Bulbul	E	r
Nicator gularis	White-throated Nicator	E	r

Turdidae (thrushes, chats, robins)				
	Turdus libonyana	Kurrichane Thrush	W	
	Turdus olivaceus	Olive Thrush	F	wv
	Zoothera gurneyi	Orange Thrush	F	wv,nt
	Turdus litsitsirupa	Groundscraper Thrush	W	
	Monticola angolensis	Miombo Rock Thrush	W	
	Saxicola torquata	Stonechat	G	
	Cossypha heuglini	Heuglin's Robin	R	r
	Cossypha natalensis	Red-capped Robin	F	r
	Erythropygia quadrivirgata	Eastern Bearded Scrub Robin	E	r
	Pogonocichla stellata	Starred Robin	F	?wv
	Cichladusa arquata	Collared Palm Thrush	R	
Sylviidae (warblers, cisticolas)				
	Sylvia borin	Garden Warbler	W	sv
	Hippilais icterina	Icterine Warbler	W	sv
	Acrocephalus arundinaceus	Great Reed Warbler	R	sv
	Acrocephalus palustris	European Marsh Warbler	R/F	sv
	Acrocephalus schoenobaenus	European Sedge Warbler	R/G	sv
	Acrocephalus gracilirostris	Lesser Swamp Warbler	R/G	
	Chlolopeta natalensis	African Yellow Warbler	G	
	Bradypterus baboecala	Little Rush Warbler	R/G	
	Bradypterus barratti	Barratt's Warbler	E	wv
	Schoenicola brevirostris	Broad-tailed Warbler	G	nt
	Phylloscopus trochilus	Willow Warbler	W	sv
	Seicercus ruficapilla	Yellow-throated Warbler	F	wv
	Apalis thoracica	Bar-throated Apalis	E	?wv
	Apalis chirindensis	Chirinda Apalis	F	wv
*	*Apalis melanocephala*	Black-headed Apalis	F	r
	Apalis flavida	Yellow-breasted Apalis	E	r
	Sylvietta whytii	Redfaced Crombec	W	
	Eremomela scotops	Green-capped Eremomela	W	
	Camaroptera brachyura	Green-backed Bleating Warbler	E	r
	Camaroptera stierlingi	Stierling's Barred Warbler	W	
	Cisticola juncidis	Fan-tailed Cisticola	G	
	Cisticola lais	Wailing Cisticola	G	
	Cisticola cantans	Singing Cisticola	G	
	Cisticola erythrops	Red-faced Cisticola	R/G	
	Cisticola natalensis	Croaking Cisticola	G	
	Cisticola aberrans	Rock Cisticola	W	
	Cisticola brachyptera	Shortwing Cisticola	W	
	Heliolais erythroptera	Red-winged Warbler	G	
	Prinia subflava	Tawny-flanked Prinia	G	

Muscicapidae (flycatchers)			
Muscicapta striata	Spotted Flycatcher	W	sv
Muscicapta adusta	Dusky Flycatcher	E	r
Muscicapta caerulescens	Blue-grey Flycatcher	E	r
Myloparus plumbeus	Fan-tailed Flycatcher	E	R
Melaenornis pammelaina	Black Flycatcher	W	
* *Bias musicus*	Black & White Flycatcher	E	?r
Batis capensis	Cape Batis	F	wv
Batis molitor	Chinspot Batis	W	
* *Batis soror*	Mozambique Batis	W/E	
* *Batis fratrum*	Woodwards' Batis	E	r, nt
Platysteira peltata	Black-throated Wattle-eye	F/R	r, nt
Trochocercus cyanomelas	Blue-mantled Crested Flycatcher	F	r
Trochocercus albonotatus	White-tailed Crested Flycatcher	F	wv
Terpsiphone viridis	Paradise Flycatcher	R/E	sv
Motacillidae (wagtails, pipits)			
Motacilla aguimp	African Pied Wagtail	R	
Motacilla clara	Long-tailed Wagtail	R	r
Anthus lineiventris	Striped Pipit	W	
Anthus trivialis	Tree Pipit	W	sv
Macronyx croceus	Yellow-throated Longclaw	G	
Laniidae (shrikes)			
Lanius collurio	Red-backed Shrike	G	sv
Malconotidae (bush shrikes)			
Laniarius aethiopicus	Tropical Boubou	W/E	R
Dryoscopus cubla	Southern Puffback	W/E	r
Tchagra australis	Brown-headed Tchagra	W/G	
Tchagra senegala	Black-crowned Tchagra	W/G	
Telophorus quadricolor	Gorgeous Bush Shrike	E	r
Malaconotus sulphureopectus	Orange-breasted Bush Shrike	E	r
Malaconotus nigrifrons	Black-fronted Bush shrike	F	r
Malaconotus olivaceus	Olive Bush Shrike	F	?wv
Malaconotus blachoti	Grey-headed Bush Shrike	E	r
Prionopidae (helmetshrikes)			
Prionops plumata	White Helmet Shrike	W	
Prionops retzii	Red-billed Helmet Shrike	W/E	r
* *Prionops scopifrons*	Chestnut-fronted Helmet Shrike	F	r
Sturnidae (starlings)			
Cinnyricinclus leucogaster	Amethyst Starling	W	
* *Lamprotornis corruscus*	Black-bellied Glossy Starling	F	?r

Onychoganthus mono	African Red-winged Starling	M/F	
Nectariniidae (sunbirds)			
Nectarinia bifasciata	Purple-banded Sunbird	E	?sv
Nectarinia manoensis	Miombo Double-collared Sunbird	W	
Nectarinia venusta	Yellow-bellied Sunbird	W/E	?r
Nectarinia talatala	White-bellied Sunbird	W	
Nectarinia olivacea	Olive Sunbird	F	r
Nectarinia senegalensis	Scarlet-chested Sunbird	W/F	
Nectarinia amethystina	Black Sunbird	W/F	
Anthreptes collaris	Collared Sunbird	F	r
* *Anthreptes reichenowi*	Blue-throated Sunbird	F	?sv
Anthreptes longuemarei	Violet-backed Sunbird	E	sv
Zosteropidae (white-eyes)			
Zosterops senegalensis	Yellow White-eye	E	r
Ploceidae (weavers, sparrows)			
Passer domesticus	House Sparrow	G	
Passer griseus	Grey-headed Sparrow	W/G	
Petronia superciliaris	Yellow-throated Sparrow	W/G	
Ambylospiza albifrons	Thick-billed Weaver	G/E	r
Ploceus bicolor	Dark-backed Weaver	F	r
Ploceus ocularis	Spectacled Weaver	R/E	
Ploceus xanthops	Large Golden Weaver	R	
Quelea quelea	Red-billed Quelea	G	
Euplectes hordeaceus	Fire-crowned Bishop	G/R	
Euplectes albonotatus	White-winged Whydah	G	
Euplectes ardens	Red-collared Whydah	G	
Vidua macroura	Pin-tailed Widow	G	
Vidua funerea	Brown-backed Firefinch Indigobird	G	
Vidua chalybeata	Red-billed Firefinch Indigobird	G	
Estrildidae (waxbills, fire finches)			
Pytilia melba	Green-winged Pytilia	G	
Mandingoa nittidula	Green Twinspot	E	sv
Pyrenestes minor	Lesser Seedcracker	E	?sv
Hypargos niveoguttatus	Red-throated Twinspot	F	r
Lagonosticta rubricata	Brown-backed Firefinch	E	r
Lagonosticta rhodopareia	Pink-backed Firefinch	G/E	
Lagonosticta senegala	Red-billed Firefinch	G	
Uraeginthus angolensis	Southern Blue Waxbill	G/W	
Estrilda astrild	Common Waxbill	G	
Estrilda perreini	Black-tailed Grey Waxbill	G/E	r
Estrilda quartinia	East African Swee	G/E	?wv

Spermestes cucullatus	Bronze Mannikin	G/W	
Spermestes bicolor	Red-backed Mannikin	G/E	r
Fringillidae (canaries, buntings)			
Serinus mozambicus	Yellow-eyed Canary	W	
Serinus sulphuratus	Bully Canary	G	
Serinus gularis	Streaky-headed Seedeater	G/W	
Serinus mennelli	Black-eared Seedeater	W/G	
Emberiza cabanisi	Cabanis's Yellow Bunting	W	
Emberiza tahapisi	Cinnamon-breasted Rock Bunting	M	

ANNEX 10. REPTILES AND AMPHIBIANS

Checklist of reptiles and amphibians from the Chimanimani Mountains and Rusitu Valley areas with Portuguese common names. Most records are from the Zimbabwe side. Sources: Don Broadley in Dutton & Dutton (1975), plus records from the unpublished Haroni-Rusitu Visitor's Guide (BFA 2000). Nomenclature updated by Werner Conradie (March 2017).

E = endemic; (M) = confirmed for Mozambique side; (p) = probably present in area

Scientific name	**Common name (Port.)**
REPTILIA	
Order Testudinata	
Pelusios sinatus	Cágado de carapaça serrada (p)
Kinyxs bellian bellian	(p)
Order Crocodylia	
Crocodylus niloticus	Crocodilo do nilo
Order Squamata	
Suborder Sauria	
Family Gekkonidae	
Hemidactylus tasmani	Osga de Tasman (M)
Hemidactylus platycephalus	Osga dos inbondeiros
Lygodactylus capensis capensis	Osga anã do Cabo
Family Agamidae	
Agama armata	Agama espinhosa
Agama kirkii	Agama das rochas (M)
Agama mossambica	Agama de Moçambique (M)
Family Chamaeleonidae	
Chamaeleo dilepis dilepis	Camaleão comum
Rhampholeon marshalli	Camaleão anãi
Family Scincidae	
Trachylepis boulengeri	Lagarticha de boulengeri
Trachylepis margaritifera	Lagarticha multi-colorida (M)
Trachylepis varia	Lagarticha variegada (M)
Trachylepis striata	Lagarticha comum listrada
Panspis wahlbergii	Lagarticha wahlberg
Acontias plumbeus	Lagarticha despernada gigante (M)
Family Cordylidae	
Matobosaurus validus validus	Lagarto escamoso das rochas (M)
Gerrhosaurus flavigularis	Lagarto escamoso de garganta amarela (M)
Smaug mossambicus	Lagarto de Moçambique de cauda espinhosa
Cordylus rhodesianus	Lagarto da Rodésia de cauda espinhosa (M)
Platysaurus ocellatus **E**	Lagarto achatado das rochas (M)
Platysaurus intermedius rhodesianus	Lagarto achatado da Rodésia
Chamaesaura macrolepis macrolepis	Lagarto escamoso despernado (M)
Family Lacertidae	
Nueras ornata	Lagarto da areia listrado (p)

Family Varanidae	
Varanus niloticus	Varamo da água (p)
Family Amphisbaenidae	
Chirindia swynnertoni	Lagarto-verme de swynnerton (M)
Suborder Serpentes	
Family Typhlopidae	
Afrotyphlops mucruso	Cobra cega do Zambeze
Family Leptotyphlopidae	
Leptotyphlops scutifrons	Cobra cega de rosca
Family Boidae	
Python natalensis	Pitão
Family Colubridae	
Lycodonomorphus leleupi mlanjensis	Cobra aquática de Milange
Lycodonomorphus rufulus	Cobra aquática castanha (M)
Boaedon fulignosus fulignosus	Cobra das casas castanha
Lycophidion capense capense	
Lycophidion nanus	
Gonionotophis capensis capensis	Cobra dorso de lima (p)
Natriciteres sylvatica	
Pseudaspis cana	Cobra toupeira (p)
Duberria rhodesiana	Cobra papa-lesmas
Philothamnus hoplogaster	Cobra verde Oriente
Philothamnus irregularis irregularis	Cobra verde do Ocidente
Prosymna ambigua ambigua	Cobra focinho de pá da África Oriental (p)
Amphlorhinus multimaculatus	Cobra multimaculada (M)
Crotaphopeltis hotamboeia	
Dispholidus typus viridis	Cobra das árvores (M)
Thelotornis capensis capensis	Cobra trepadoura do Cabo
Psamophylax tritaeniatus	Cobra verde do capim
Psammophis sibilans sibilans	
Psammophis crucifer	(M)
Aparallactus guntherii	Cobra papa-eentopeias de Gunther
Aparallactus capensis	Cobra papa-centopeias do Cabo
Dasypeltis scabra	Cobra papa-ovos (p)
Dasypeltis medici medici	Cobra papa-ovos de Medici
Family Elapidae	
Naja melanoleuca	Cobra de floresta
Dendroaspis augusticeps	Mamba verde
Family Viperidae	
Atractaspis bibroni	Víbora escavadoura
Causus rhombeatus	Víbora nocturna
Causus defilippii	Víbora nocturna focinhuda (M)
Bitis atropos atropos	(M)
Bitis arietans arietans	Víbora sopradoura
Bitis gabonica gabonica	Víbora do gabão

AMPHIBIANS
Order Anura

Família Pipidae	
Xenopus laevis laevis	Rã de garras
Family Bufonidae	
Sclerophrys gutturalis	Sapo malhado (M)
Sclerophrys pusilla	Sapo pequeno malhado
Poyntonophrynus fenoulheti	[was considered endemic as *Bufo vertebralis grindleyi*, now not] (M)
Mertensophryne anotis	(M)
Family Microhylidae	
Breviceps adspersus	Rã das chuvas do Kalahari
Breviceps mossambicus	Rã das chuvas de Moçambique
Family Ranidae	
Amietia delalandii	Rã (M)
Strongylopus rhodesiana	Rã de Gray
Strongylopus fasciatus	Rã listrada (M)
Amnirana darlingi	Rã de costas douradas
Ptychadena oxyrhynclius	Rã de nariz ponteagudo
Ptychadena anchietae	Rã rugosa da savanna
Ptychadena porosissima	(p)
Ptychadena uzungwensis	Rã rugosa da montanha
Ptychadena guibei	Rã rugosa de ventre amarelo (p)
Phrynobatrachus natalensis	Rã do Natal
Phrynobatrachus acridoides	Rã dos charcos tropicais
Phrynobatrachus stewartae	
Phrynobatrachus mababiensis	Rã dos charcos
Arthroleptis stenodactylus	Rã guinchadoura de dedos finos
Arthroleptis troglodytes **E**	Rã guinchadoura troglodita
Arthroleptis xenodactyloides xenodactyolides	Rã guinchadoura da floresta
Leptopelis flavomaculatus	Rela de manchas amarelas
Leptopelis broadleyi	Rela
Kassina senegalensis	Rã corredoura do Senegal
Afrixalus brachycnemis brachycnemis	Rela
Afrixalus fornasinii fornasinii	Rela de fornasni
Hyperolius argus	Rela malhada
Hyperolius tuberilinguis	Rela verde
Hyperolius inyangae	Rela de nariz ponteagudo
Hyperolius swynnertoni swynnertoni	Rela de Swynnerton (M)
Hyperolius swynnertoni broadleyi	Rela de Broadley
Hyperolius marmoratus taeniatus	Rela listrada

ANNEX 11. CHECKLIST OF REPTILES AND AMPHIBIANS FROM LOWER RUSITU VALLEY, ZIMBABWE

Checklist with Engish common names compiled by Don Broadley from collections from the Lower Rusitu valley area of south-eastern Zimbabwe over a number of decades. Source: unpublished Visitor's Guide to the Lower Rusitu Valley (BFA 2000). Nomenclature corrected and updated (2017) by Werner Conradie (BayWorld, Port Elizabeth, South Africa).

* = species with a very restricted range in Zimbabwe
** = species endemic to the Chimanimani National Park and environs

	Family/species	common name
	SAURIA (lizards)	
	Agamidae (agamas)	
	Agama kirkii	Kirk's Rock Agama
*	*Agama mossambica*	Mozambique Agama
	Chamaeleonidae (chameleons)	
	Chamaeleo dilepis	Flap-necked Chameleon
	Gekkonidae (geckos)	
	Hemidactylus platycephalus	Baobab Gecko
	Hemidactylus tasmani	Tasman's Rock Gecko
	Lygodactylus capensis	Cape Dwarf Gecko
	Scincidae (skinks)	
	Acontias plumbeus	Giant Legless Skink
*	*Trachylepis boulengeri*	Boulenger's Skink
	Trachylepis margaritifera	Rainbow Skink
	Trachylepis striata	Common Striped Skink
	Trachylepis varia	Common Variable Skink
	Gerrhosauridae (plated lizards)	
	Gerrhosaurus flavigularis	Yellow-throated Plated Lizard
	Cordylidae (girdled and flat lizards)	
*	*Smaug mossambicus*	Mozambique Girdled-lizard
**	*Platysaurus ocellatus*	Spotted Flat-lizard
	AMPHISBAENIA (worm lizards)	
*	*Chirindia swynnertoni*	Swynnerton's Worm-lizard

	SERPENTES (snakes)	
	Typhlopidae (blind snakes)	
	Typhlops mucruso	Zambezi Blind-snake
	Leptotyphlopidae (worm snakes)	
	Leptotyphlops incognitus	Incognito Worm-snake
	Leptotyphlops scutifrons	Peters' Worm-snake
	Pythonidae (pythons)	
	Python natalensis	Southern African Python
	Viperidae (vipers)	
	Bitis arietans arietans	Puffadder
	Bitis gabonica	Gaboon Viper
	Causus defilippii	Snouted Nightadder
	Causus rhombeatus	Rhombic Nightadder
	Atractaspididae (stiletto snakes)	
	Aparallactus guentheri	Günthers Centipede-eater
	Aparallactus capensis	Cape Centipede-eater
	Atractaspis bibronii	Bibron's Stiletto Snake
	Elapidae (elapids)	
	Dendroaspis angusticeps	Green Mamba
	Naja melanoleuca	Forest Cobra
	Colubridae (typical snakes)	
	Crotaphopeltis hotamboeia	Herald Snake
*	*Dasypeltis medici*	East African Egg-eater
	Dispholidus typus	Boomslang
	Lamprophis capensis	Brown House-snake
	Lycophidion capense	Cape Wolf-snake
*	*Lycophidion nanum*	Dwarf Wolf-snake
	Philothamnus angolensis	Angolan Green-snake
	Philothamnus hoplogaster	Eastern Green-snake
	Philothamnus semivariegatus	Variegated Bush-snake
	Psammophis mossambicus	Olive Grass Snake
	Thelotornis mossambicana	Eastern Savanna Vine-snake
	CROCODYLIA (crocodiles)	
	Crocodylus niloticus	Nile Crocodile (? waif)

	AMPHIBIA (amphibians)	
	Bufonidae (toads)	
	Sclerophrys gutturalis	Guttural Toad
	Sclerophrys pusilla	Flat-back Toad
	Microhylidae (rain frogs)	
	Breviceps mossambicus	Mozambique Rain-frog
	Ranidae (ranids)	
	Amnirana darlingi	Golden-backed Frog
	Phrynobatrachus acridoides	Zanzibar Puddle-frog
	Phrynobatrachus natalensis	Natal Puddle-frog
	Phrynobatrachus parvulus	Dwarf Puddle-frog
	Ptychadena anchietae	Plain Grass-frog
*	*Ptychadena guibei*	Guibe's Grass-frog
	Ptychadena oxyrhynchus	Sharp-snouted Grass-frog
	Ptychadena uzungwensis	Udzungwe Grass-frog
	Amietia delalandii	Common River Frog
	Strongylopus rhodesianus	Hewitt's Long-toed Frog
	Arthroleptidae (squeakers)	
	Arthtroleptis stenodactylus	Shovel-footed Squeaker
	Arthroleptis xenodactyloides	Hewitt's Forest Squeaker
	Hyperoliidae (tree and reed frogs)	
	Afrixalus crotalus	Rattling Spiny Reed-frog
	Afrixalus fornasinii	Fornasini's Spiny Reed-frog
*	*Hyperolius argus*	Argus Reed-frog
	Hyperolius inyangae	Sharp-snouted Reed-frog
	Hyperolius swynnertoni	Swynnerton's Reed-frog
	Hyperolius tuberilinguis	Tinker Reed-frog
	Kassina senegalensis	Senegal Running-frog
*	*Leptopelis broadleyi*	Broadley's Tree-frog
	Leptopelis flavomaculatus	Yellow-spotted Tree-frog
	Leptopelis mossambicus	Mozambique Tree-frog
	Hemisotidae (shovel-snouted frogs)	
	Hemisus marmoratus	Marbled Shovel-snouted Frog

APPENDIX 12. CHECKLIST OF FRESHWATER FISHES

Checklist of freshwater fish found in the Chimanimani area of Mozambique and Zimbabwe with English common names. Ssources: Graham Bell-Cross (1973) in Dutton & Dutton (1975), with additions from Minshull & Marshall in BFA (2000). Nomenclature updated by Roger Bills (2017).

R = Rusitu River, Zimbabwe; o = caught in open water; r = caught under rocks
mo = typical montane species; low = typical lowland species

Family/species	Common name (Eng.)	Notes
LEPIDOSIRENIDAE		
Protoptents annectens brieni	Lungfish	
ANGUILLIDAE		
Anguilla bengalensis labiata	African Mottled Eel	
Anguilla mossambica	Long-finned Plain Eel	
MORMYDAE		
Mormyrops anguilloides	Cornish Jack	
Hippopotamyrus ansorgii	Slender Stonebasher	low,R,r
Cyphomyrus discorhynchus	Zambezi Parrotfish	
Gnathoneumus macrolepidotus	Bulldog	
Mormyrus longirostris	Eastern Bottlenose	
KNERIIDAE		
Kneria auriculata	Kneria	mo,r
HARACIDAE		
Hydrocynus vittatus	Tigerfish	
Brycinus imberi	Imberi	
Brycinus lateralis	Striped Robber	
Micralestes acutidens	Silver Robber	R,o
DISTICHODONTIDAE		
Distichodus mossambicus	Nkupe	
Distichodus schenga	Chessa	
CYPRINIDAE		
Labeobarbus marequensis	Large-scaled Yellowfish	R,o
Barbus trimaculatus	Threespot Barb	
Barbus afrohamiltoni	Hamilton's Barb	
Barbus autaenia	Orange-finned Barb	R
Barbus manicensis	Yellow Barb	
Barbus lineomaculatus	Spotted Barb	
Barbus viviparus	Twinstriped Barb	
Barbus barnardi	Barnard's Barb	
Barbus radiatus	Red-eyed Barb	
Barbus toppini	Toppin's Barb	
Varicorhinus pungweensis	Pungwe Yellowfish	mo,R,p
Labeo cylindricus	Striped Mudsucker	

Labeo molybdinus	Leaden Mudsucker	
Labeo rubropunctatus	Red-spotted Mudsucker	
Labeo congoro	Purple Mudsucker	
Labeo altivelis	Hunyani Salmon	
Opsaridium zambezense	Barred Minnow	o
BAGRIDAE		
Chrysichthys hildae	Hilda's Grunter	
Leptoglanis rotundiceps	Spotted Catlet	
SHILBEIDAE		
Eutropius depressirostris	Butter Barbel	
Schilbe intermedius	Silver Barbel	low,R
AMPHILIIDAE		
Amphilius platychir	Mountain Barbel	
Amphilius uranoscopus	Common Mountain Catfish	mo,r
CLARIIDAE		
Clarius gariepinus	Sharp-toothed Catfish	R
MALAPTERURIDAE		
Malapterurus electricus	Electric Barbel	
MOCHOKIDAE		
Synodontis zambezensis	Brown Squeaker	
Chiloglanis pretoriae	Limpopo Rock-catlet	
CYPRINODONTIDAE		
Aplocheilichthys johnstoni	Johnston's Top-minnow	
CICHLIDAE		
Oreochromis placidus	Black Tilapia	
Oreochromis macrochir	Green-headed Tilapia	
Oreochromis mossambicus	Mozambique Tilapia	R,o
Tilapia sparrmanii	Banded Tilapia	
Tilapia rendalli	Red-breasted Tilapia	
Astatotilapia calliptera	Eastern Dwarf Tilapia	low,R,o
GOBIIDAE		
Awaous aeneofuscus	Small-scaled Goby	
Glossogobius giurus	Large-scaled Goby	

ANNEX 13. FISH CHECKLIST FROM LOWER RUSITU VALLEY, ZIMBABWE

Checklist of freshwater fishes with English common names recorded from the lower Rusitu Valley part of Zimbabwe (from J.L. Minshull & B. Marshall in BFA 2000). Compiled from collections made by the Rhodesian Schools Exploration Society and records from the Natural History Museum, Bulawayo.

R = caught under rocks, O = caught in open water,
P = caught in pools near Haroni Gorge, Rus = recorded from Rusitu River,
* = typical mountain species, ** = typical lowland species.

Species	**Common name**	**Notes**
Hippopotamyrus ansorgii **	Slender Stonebasher	R,P,Rus
Anguilla bengalensis labiata	African Mottled Eel	P
Kneria auriculata *	Southern Kneria	R
Barbus eutaenia	Orange-finned Barb	P,Rus
Barbus marequensis	Large-scaled Yellowfish	O,P,Rus
Barbus 'zambezense' (possibly *B. radiatus*, *B. toppini*, *B. manicensis* or *B. trimaculatus*)	Barbs (minnows)	O
Varicorhinus pungweensis *	Pungwe Chiselmouth	P,Rus
Opsaridium zambezense	Barred Minnow	O
Micralestes acutidens	Silver Robber	O,Rus
*Amphilius uranoscopus**	Common Mountain Catfish	P,R
Clarias gariepinus	African Catfish (barbel)	P,Rus
Schilbe intermedius **	Silver Barbel	Rus?
Astatotilapia calliptera **	Eastern Happy	O,P,Rus
Oreochromis mossambicus	Mozambique Tilapia	O,P,Rus

ANNEX 14. CHECKLIST OF BUTTERFLIES FROM THE LOWER RUSITU VALLEY

Checklist of butterflies with English common names compiled by Alan Gardiner from personal and museum records as part of the unpublished Visitors Guide to the Lower Rusitu Valley (BFA 2000). Nomenclature follows Pennington (1994).

* = rare or species of restricted range in Zimbabwe

SUPERFAMILY HESPERIOIDEA

Family Hesperiidae

Subfamily Coeliadinae

	Coeliades forestan forestan	Striped Policeman
*	Coeliades libeon	Spotless Policeman
	Coeliades pisistratus	Two Pip Policeman

Subfamily Pyrginae

	Calleagris jamesoni	Jameson's Flat (Skipper)
	Celaenorrhinus galenus	Orange Flat
	Eretis melania	Dusky Elf
	Spialia diomus diomus	Diomus Grizzled Skipper
	Spialia diomus ferax	Diomus Grizzled Skipper
	Spialia spio	Common Grizzled Skipper
	Tagiades flesus	Clouded Flat

Subfamily Hesperiinae

	Acada biseriata	Axehead Skipper
	Acleros mackenii	Macken's Skipper
	Andronymus caesar philander	White Dart
	Andronymus neander neander	Nomad Dart
	Borbo borbonica borbonica	Olive Haired Swift
	Borbo fanta fanta	Fanta Swift
	Borbo fatuellus fatuellus	Long Horned Swift
	Borbo holtzi	Variable Swift
	Borbo lugens	Lesser-horned Swift
	Fresna nyassae	Variegated Acraea Skipper
	Gegenes niso	Common Hottentot Skipper
*	Gorgyra johnstoni	Johnston's Skipper
*	Metisella orientalis orientalis	Eastern Sylph
	Parnara naso monasi	Water Watchman
	Platylesches galesa	White-tail Hopper
*	Semalea pulvina	Silky Dart
	Teniorhinus harona	Arrowhead Orange (Arrowhead Skipper)
	Zenonia zeno	Orange-spotted Skipper
	Zophopetes dysmephila	Palm Tree Nightfighter

SUPERFAMILY PAPILIONOIDEA

Family Papilionidae

Subfamily Papilioninae

	Graphium angolanus angolanus	Angolan White Lady
	Graphium antheus	Large Striped Swordtail
	Graphium leonidas leonidas	Veined Swordtail

	Graphium policenes policenes	Small Striped Swordtail
	Graphium porthaon porthaon	Cream-Striped Swordtail
	Papilio constantinus constantinus	Constantine's Swallowtail
	Papilio dardanus cenea	Mocker Swallowtail
	Papilio demodocus demodocus	Citrus Swallowtail
*	Papilio echerioides chirindanus	White-banded Swallowtail
	Papilio nireus lyaeus	Narrow Green-Banded Swallowtail
*	Papilio ophidicephalus chirinda	Emperor Swallowtail

Family Pieridae

Subfamily Coliadinae

	Catopsilia florella	African Emigrant
	Eurema brigitta brigitta	Small Grass Yellow
	Eurema desjardinsii marshalli	Angled Grass Yellow
	Eurema desjardinsii marshalli f. regularis	Angled Grass Yellow
*	Eurema hapale	Marsh Grass Yellow
	Eurema hecabe solifera f. solifera	Common Grass Yellow
*	Eurema hecabe solifera f. senegalensis	Common Grass Yellow

Subfamily Pierinae

	Appias epaphia contracta	African Albatross (Diverse White)
*	Appias sabina phoebe	Albatross White
	Belenois aurota aurota	Caper (Brown Veined) White
	Belenois creona severina	African Caper (Common White)
	Belenois gidica abyssinica	Pointed Caper (African Veined White)
*	Belenois thysa thysa	False Dotted Border
	Colotis celimene amina	Magenta Tip
	Colotis eris eris	Banded Gold Tip
	Colotis euippe omphale	Round-Winged Orange Tip
	Colotis evagore antigone	Tiny Orange Tip
	Colotis ione	Purple Tip
	Leptosia alcesta inalcesta	African Wood White
	Mylothris agathina agathina	Eastern Dotted Border
	Mylothris rueppellii haemus	Rueppell's (Twin) Dotted Border
*	Mylothris yulei yulei	Yule's Dotted Border
	Nepheronia argia mhondana	Large Vagrant
	Nepheronia thalassina sinalata	Blue or Cambridge Vagrant
	Pinacopteryx eriphia eriphia	Zebra White

Family Nymphalidae

Subfamily Acraeinae

	Acraea (Acraea) acrita	Angolan Fiery Acraea
	Acraea (Acraea) aganice aganice	Common Wanderer
	Acraea (Acraea) aglaonice	Clear Spotted Acraea
	Acraea (Acraea) anemosa	Broad Bordered Acraea
	Acraea (Acraea) caldarena caldarena	Black Tip Acraea
*	Acraea (Acraea) egina areca	Elegant Acraea
	Acraea (Acraea) natalica	Natal Acraea
	Acraea (Acraea) nohara halali	Light Red Acraea
	Acraea (Acraea) oncaea	Window Acraea
*	Acraea (Acraea) satis	East-coast Acraea
*	Acraea (Actinote) cabira	Yellow-banded Acraea

	Acraea (Actinote) encedon encedon	Encedon (White Barred) Acraea
	Acraea (Actinote) eponina	Orange Acraea
*	Acraea (Actinote) esebria esebria	Dusky Acraea
*	Acraea (Actinote) igola	Dusky-veined Acraea
*	Acraea (Actinote) johnstoni johnstoni	Johnston's Acraea
*	Acraea (Actinote) pentapolis epidica	Scarce Tree-top Acraea
	Subfamily Danainae	
	Amauris (Amaura) echeria lobengula	Chief Friar
	Amauris (Amaura) ochlea ochlea	Novice Friar
	Amauris (Amauris) niavius dominicanus	Common Friar
	Danaus (Anosia) chrysippus aegyptius	Common Tiger (African Monarch)
	Subfamily Satyrinae	
	Bicyclus anynana anynana	Squinting Bush Brown
*	Bicyclus campina campina	Chirinda Bush Brown
	Bicyclus safitza safitza	Common Bush Brown
*	Gnophodes betsimena diversa	Banded Evening Brown
	Henotesia perspicua	Marsh Patroller
	Melanitis leda helena	Common Evening Brown
	Stygionympha wichgrafi lannini	Wichgraf's Brown
	Ypthima impura paupera	Bushveld Ringlet
	Ypthimomorpha itonia	Swamp Ringlet
	Subfamily Argynninae	
	Lachnoptera ayresii	Blotched Leopard
*	Phalanta eurytis eurytis	Forest Leopard
	Phalanta phalantha aethiopica	Common Leopard Fritillary
	Subfamily Nymphalinae	
	Catacroptera cloanthe cloanthe	Pirate
	Cynthia cardui	Painted Lady
	Hypolimnas anthedon wahlbergi	Variable Diadem
*	Hypolimnas deceptor deceptor	Deceptive Diadem
	Hypolimnas misippus	Diadem (Danaid Eggfly)
	Junonia archesia archesia	Garden Inspector
	Junonia artaxia	African Pansy (Commodore)
	Junonia hierta cebrene	Yellow Pansy
	Junonia natalica natalica	Natal Pansy
	Junonia octavia sesamus	Gaudy Commodore
	Junonia oenone oenone	Dark Blue Pansy
	Junonia terea elgiva	Soldier Pansy
	Junonia tugela tugela	Dry Leaf (Eared) Commodore
	Salamis parhassus	Common Mother-of-Pearl
	Subfamily Limenitinae	
*	Aterica galene theophane	Forest Glade Nymph
*	Bebearia orientis orientis	Eastern Palm Forester
	Byblia anvatara acheloia	African Joker
	Byblia ilithyia	Joker
*	Cymothoe coranus	Coast Glider
*	Cyrestis camillus sublineata	African Map Butterfly
*	Euphaedra neophron neophron	Gold-banded Forester
*	Euphaedra orientalis	Orange Forester (Fig Eater)

*	Euriphene (Euryphura) achlys	Mottled Green
	Eurytela dryope angulata	Golden Piper
	Eurytela hiarbas lita	Pied Piper
	Hamanumida daedalus	Guineafowl
*	Neptidopsis ophione	Scalloped Sailer
	Neptis alta	High (Old) Sailer
*	Neptis goochii	Streaked Sailer
	Neptis kiriakoffi	Kiriakoff's Sailer
	Neptis laeta	Common Sailer
	Neptis saclava marpessa	Small Spotted Sailer
	Neptis serena serena	River Sailer
	Pseudacraea boisduvalii trimeni	Boisduval's False Acraea
	Pseudacraea lucretia expansa	False Chief (Pied False Acraea)
*	Sallya amulia rosa	Lilac Tree Nymph
	Sallya boisduvali boisduvali	Boisduval's Tree Nymph
	Sallya moranti moranti	Morant's Tree Nymph
*	Sallya natalensis	Natal Tree Nymph

Subfamily Charaxinae

	Charaxes achaemenes achaemenes	Bush Charaxes
*	Charaxes acuminatus vumba	Mountain Pearl Charaxes
	Charaxes bohemani	Large Blue Charaxes
	Charaxes brutus natalensis	White Barred Charaxes
	Charaxes candiope candiope	Green-Veined Charaxes
*	Charaxes castor flavifasciatus	Giant Charaxes
*	Charaxes cithaeron cithaeron	Blue Spotted Charaxes
	Charaxes druceanus stevensoni	Silver Barred Charaxes
*	Charaxes etesipe tavetensis	Savannah Charaxes
	Charaxes ethalion ethalion	Satyr Charaxes
	Charaxes guderiana guderiana	Guderian's Charaxes
	Charaxes macclounii	Red Coast (MacClounie's) Charaxes
	Charaxes manica	Manica Charaxes
*	Charaxes pollux gazanus	Black-Bordered Charaxes
*	Charaxes protoclea azota	Flame Bordered Charaxes
	Charaxes varanes vologeses	Pearl Charaxes
*	Charaxes violetta melloni	Violet Spotted Charaxes
*	Charaxes xiphares vumbui	Forest King Charaxes
	Charaxes zoolina zoolina	Club Tailed Charaxes
*	Euxanthe wakefieldi	Forest Queen

Subfamily Libytheinae

Libythea labdaca laius Trimen, 1879	African Beak or Snout

Family Lycaenidae

Subfamily Lipteninae

*	Baliochila barnesi	Barnes's Buff
*	Ornipholidotos peucetia peucetia	White Mimic
*	Pentila tropicalis tropicalis	Spotted Buff
*	Teriomima puellaris	Two-dotted Buff

Subfamily Miletinae

Lachnocnema bibulus	Woolly Legs

Subfamily Theclinae

	Aphnaeus erikssoni	Eriksson's Silver Spot
*	Axiocerses punicea	Rainforest Scarlet
	Axiocerses tjoane	Eastern Scarlet
	Deudorix (Pilodeudorix) caerulea	Blue Heart Playboy
	Deudorix (Virachola) antalus	Brown Playboy
*	Deudorix (Virachola) dariaves	Black & Orange Playboy
	Deudorix (Virachola) dinochares	Apricot Playboy
*	Deudorix (Virachola) dinomenes	Orange Playboy
	Deudorix (Virachola) diocles	Orange-Barred Playboy
*	Deudorix (Virachola) lorisona coffea	Coffee Playboy
*	Hypolycaena buxtoni buxtoni	Buxton's Hairstreak
	Hypolycaena phillipus phillipus	Common Hairstreak
*	Hypolycaena tearei	Teare's Hairstreak
	Iolaus (Argiolaus) silarus	Sapphire
	Iolaus (Epamera) australis	Eastern Sapphire
	Iolaus (Epamera) bakeri	Baker's Sapphire
	Iolaus (Epamera) mimosae rhodosense	Mimosa Sapphire
	Iolaus (Epamera) sidus	Red-Line Sapphire
	Iolaus (Iolaphilus) trimeni	Trimen's Sapphire
*	Iolaus (Pseudiolaus) poultoni	Poulton's Sapphire
	Iolaus (Stugeta) bowkeri tearei	Bowker's Marbled Sapphire
*	Lipaphnaeus aderna spindasoides	Bramble False Hairstreak
	Spindasis ella	Ella's Silverline
	Spindasis natalensis	Natal Silverline
*	Spindasis victoriae	Victoria Silverline

Subfamily Polyommatinae

*	Anthene kersteni	Kersten's Hairtail
*	Anthene sheppardi	Sheppard's Hairtail
	Azanus mirza	Pale Babul Blue
	Cacyreus lingeus	Common Bush Blue
	Eicochrysops hippocrates	White Tipped Blue
	Euchrysops malathana	Smoky Bean Cupid
	Lampides boeticus	Pea Blue
	Leptotes brevidentatus	Tite's Zebra Blue
	Leptotes pirithous pirithous	Common Zebra Blue
*	Oboronia bueronica	Ginger Blue
	Zizula hylax	Tiny Grass Blue

ANNEX 15. ODONATA (DRAGONFLY) CHECKLIST FROM LOWER RUSITU VALLEY, ZIMBABWE

Checklist compiled by Moira Fitzpatrick for the unpublished Visitor's Guide of the Lower Rusitu Valley (BFA 2000) from specimens held at the Natural History Museum, Bulawayo and field collections by Rafael Chiwanga (2000).

Species	**Notes**
Chlorocnemis marshalli	Found in forest or thick bush
Ceriagrion glabrum	Occurs in dense bush and light forest at pool
Pseudagrion gamblesi	Found in reedy verges of fast streams
Pseudagrion hageni	Occurring in forest and bush along well shaded streams
Pseudagrion kersteni	very common throughout the continent in all habitats
Enallagma subtile	Pools in shade, sometimes forest clearings
Platycypha caligata	widespread, along running streams
Phaon iridipennis	widespread in woodland
Gomphidia quarrei	reedy or wooded margins of streams and nearby forest clearings
Anax imperator	common migrant found in most open localities
Anax speratus	flies along running water, widespread species
Tetrathemis polleni	found in quiet well-shaded pools in low lying bush or thin forest
Hadrothemis scabrifrons	thick bush, forest or gallery forest
Orthetrum julia	in thick forest, widespread
Nesciothemis farinosa	open bush and woodland throughout Africa
Hemistigma albipuncta	bush, woodland and light forest
Eleathemis quadrigutta	only known from Haroni river
Crocothemis sanguinolenta	widespread along pools, streams and bush
Trithemis arteriosa	widespread and very common throughout Africa
Trithemis kirbyi	widespread and common in Africa
Trithemis pluvialis	thick bush or forest along streams
Zygonyx natalensis	hovers over waterfalls and rapids in thin forest