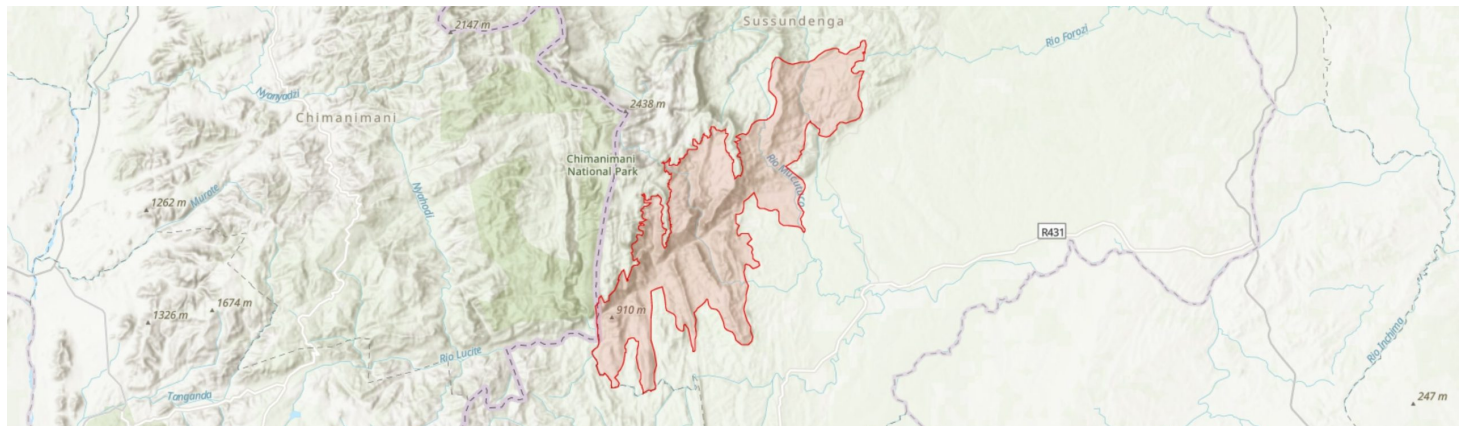


Chimanimani Lowlands

MOZTIPA003A



Country: **Mozambique**

Administrative region: **Manica (Province)**

Central co-ordinates: **-19.90778 N, 33.16472 E**

Area: **514km²**

Qualifying IPA criteria

A(i), A(iii), A(iv), B(ii), C(iii)

IPA assessment rationale

The Chimanimani Lowlands qualify as an IPA under all three criteria. This area supports important populations of 14 criterion A(i) globally threatened species, of which one is Critically Endangered, six are Endangered and seven are Vulnerable. Two of these species - *Streptocarpus acicularis* (CR) and *Ficus muelleriana* (EN) - are known only from within this IPA, and all except *Coffea salvatrix* (EN) are highly range-restricted. The site also contains important populations of one A(iii) species and three A(iv) species that have not yet been assessed on the IUCN Red List. The site also qualifies under Criterion B(ii) for its exceptional richness of range-restricted species, with 20 species with a range of 10,000 km² including two national endemics, significantly above the threshold of 3% of the national list of priority species. Under Criterion C(iii), it qualifies on the basis of containing the largest extent of Low Altitude Moist Forest in Mozambique and important intact areas of Medium Altitude Moist Forest, both highly range restricted and nationally threatened habitats in the country.

Site description

This IPA encompasses the lowlands and foothills associated with the southern and eastern flanks of the Chimanimani Mountains in Sussundenga District of Manica Province, Mozambique. The site

starts in the west on the Zimbabwe border at Makurupini Falls and the Lucite River, then extends northeast through portions of the Maronga, Zomba and Moribane Forest Reserves and also into the lower-elevation southern portion of the core Chimanimani National Park (CNP). Much of this area would originally have been covered in lowland moist forest, interspersed with miombo woodland and with natural wetlands and rock outcrops. There has been significant transformation and fragmentation of natural habitats outside of the core CNP but significant remnants of the key habitats are still intact. It is immediately abutted to the north and west by the Chimanimani Highlands IPA with the 1,200 m elevation contour forming the boundary; they are separated here to draw attention to their differing floras and management issues (Rokni et al. 2019), but could be treated together as the Chimanimani IPA.

Botanical significance

The Chimanimani Lowlands are of botanical importance primarily for the extensive areas of lowland moist evergreen and semi-deciduous forest, the largest extent of this highly threatened forest type in Mozambique (Timberlake et al. 2016; Rokni et al. 2019). Although low in species richness, these forests contain a significant number of both regionally and globally rare plant species, several of which are restricted to these forests together with the contiguous Haroni-Rusitu forests of Zimbabwe. These include the spectacular herb *Streptocarpus acicularis* (CR) which is only known from the type locality within this IPA, the understory shrub *Vepris drummondii* (VU) and the recently described understory tree *Synsepalum chimanimani* (EN) (Rokni et al. 2019). They also support a number of outlier and edge-of-range populations. For example, the fig tree *Ficus mucoso* (LC) and the forest climber *Raphidiocystis chrysocoma* are both West African species that are known in the Flora Zambesiaca region only from these forests, whilst *Phyllanthus myrtaceus* is primarily a South African species but with an outlier population in the Chimanimani Lowlands (Timberlake et al. 2016;

Rokni et al. 2019). The forested areas between the Zimbabwe border and the Thekeza area of the Zomba community in the western portion of the IPA are particularly important for most of these scarce species.

Also of high botanical significance are low-elevation quartzite outcrops which support an interesting rock flora, differing from the high elevation quartzites that are so famous for their plant endemism in the Chimanimani Highlands. Particularly notable species include the endemic *Ficus muelleriana* (EN), a tiny fig that climbs on the rock faces, and *Otiophora lanceolata* (VU), a locally abundant shrublet. Other scarce species of this habitat include *Gutenbergia westii* (VU) and a disjunct population of *Sclerochiton caeruleus* (NT). Where quartzites outcrop along shaded river valleys, the Chimanimani endemic grass *Danthoniopsis chimanimaniensis* (EN) can be frequent, together with the shrub *Vernonia muelleri* subsp. *muelleri* (NT).

Small areas of seasonally wet grassland on sands support an interesting, though not diverse, herb flora including *Crepidiorhopalon flavus* (VU) whose range is centred on the southern Chimanimani foothills, and *Mesanthemum africanum* (LC), a Chimanimani endemic that is mainly found in the high mountains but occurs at much lower abundance in these lowland wet grasslands.

In total, 532 plant taxa were recorded during recent surveys of these lowland habitats, although these were far from exhaustive (Timberlake et al. 2016), and further interesting species are likely to be discovered in the future. A more thorough survey of the lowland quartzite outcrops after the main rainy season might be particularly productive given that Chimanimani quartzites are so rich in endemics at higher elevations.

Habitat and geology

This area is geologically complex, with quartzite outcrops in the western half of the site, and with areas of mica schist and in the east, granitoid and migmatite formations, all of Precambrian age (Instituto Nacional de Geología 1987). This complexity gives rise to a varied topography and soil types, with the areas of quartzite giving rise to coarse sandy soils whilst finer and deeper loamy soils are recorded at Moribane (Timberlake et al. 2016). The foothills of the Chimanimani Mountains are incised by numerous steep-sided river valleys. Climate is variable, with average annual rainfall varying from ca. 1,000 mm to > 1,500 mm per year depending on locality, with most rains falling between late November and late March; average annual temperatures are ca. 19 – 22°C (Ghiurghi et al. 2010).

The lowland forests vary considerably in species composition and in the relative extent of evergreen versus deciduous components, depending on availability of moisture and soil type. The highest proportion of evergreen elements are typically found in valleys, with a gradual to more abrupt transition to deciduous elements on ridges; the latter can transition into miombo woodland. The forest canopy varies from 20 – 30 m tall with occasional emergent to 40 m. Of particular interest botanically are the mostly evergreen forests and riverine fringes of Makurupini, Maronga and the southwestern-most part of Zomba (Thekeza). Amongst the dominant trees, these areas

support potentially the largest population globally of *Maranthes goetzeniana*. Overall, the dominant species is *Newtonia buchananii*, with *Albizia adianthifolia*, *Celtis gomphophylla*, *Erythrophleum suaveolens* and *Millettia stuhlmannii* amongst the other common species. *Terminalia* (formerly *Pteleopsis*) *myrtifolia* is mainly restricted to semi-deciduous forest, for example at Moribane Forest Reserve. Common understorey trees include *Funtumia africana* - particularly abundant at Moribane - and *Aidia micrantha*, *Rawsonia lucida* and *Tabernaemontana* spp. At Maronga, additional common understorey species include *Alchornea hirtella*, *Craterispermum schweinfurthii*, *Drypetes arguta* and *Synsepalum chimanimani*. Lianas are frequent throughout. The species composition of these forests is discussed in detail by Timberlake et al. (2016), with additional observations by Müller et al. (2005).

Along rocky riverine fringes at Maronga, *Uapaca lissopyrena* is frequent, easily identified by its stilt roots. This habitat has a characteristic understorey with small trees and shrubs of *Cleistanthus polystachyus* subsp. *milleri*, *Diospyros natalensis*, *Mascarenhasia arborescens*, *Nuxia oppositifolia*, *Tricalysia coriacea* subsp. *angustifolia* and a dwarf species of *Podocarpus* which has previously been equated with the South African *P. elongatus* or *P. latifolius* but may prove to be a distinct species restricted to the Chimanimani quartzites (Rokni et al. 2019). *Khaya anthotheca* also occurs along riverine fringes.

The forests are interspersed with areas of miombo woodland, dominated by *Brachystegia* and *Uapaca* species, particularly *B. spiciformis* and *U. kirkiana*. Other common miombo trees include *Burkea africana*, *Maprounea africana* and *Pterocarpus angolensis*. Whilst important ecologically, the miombo does not contain high numbers of rare or threatened plant species. Low-elevation outcrops of nutrient-deficient quartzites (Chimanimani sandstones) are most frequent in the Makurupini-Maronga area but are also found further east in Zomba community. These areas are usually associated with light woodland dominated by *Brachystegia tamarindoides* subsp. *microphylla*, and with an interesting herb and succulent flora on the rocks and thin soils which remains understudied.

Small areas of seasonally wet grassland with sandy-peat soils occur within the forest-woodland mosaic. Common grasses include *Hyparrhenia* spp., *Themeda triandra*, *Panicum dregeanum* and *Imperata cylindrica*, with scattered shrubs including *Dissotis princeps* and *Eriosema psoraleoides*. These wetlands can support an interesting wetland herb community, as well as patches of swamp forest with *Garcinia imperialis*, *Uapaca lissopyrena* and *Voacanga thouarsii* among the common species. At the Zomba community, there are also larger areas of swamp and lowland watercourses that are fringed by large stands of the striking tree *Pandanus livingstonianus* which, whilst fairly widespread, has very isolated and localised populations and is thought to be threatened by habitat loss. The Zomba Centro Swamp is particularly important for this species, and also supports extensive papyrus (*Cyperus papyrus*) stands (Timberlake et al. 2016).

Conservation issues

The entirety of this IPA falls within the Chimanimani National Park (CNP) and Trans-Frontier Conservation Area (TFCA): the northern portion of the site lies within the core CNP/TFCA whilst the Maronga, Moribane and Zomba Forest Reserves and surrounding community lands are within the buffer zone. The CNP has a comprehensive management plan (Ghiurghi et al. 2010) but this has not been fully implemented to date. Natural habitats within the core CNP/TFCA are largely intact with only small areas of human encroachment at present, although better demarcation of the core reserve boundary is desirable to prevent further encroachment (Timberlake et al. 2016). However, threats are severe within the buffer zone including within the three Forest Reserves which are not managed for their biodiversity, having been originally established in 1953 for timber production and possibly for watershed protection (Müller et al. 2005). Large areas of forest have either been cleared or degraded for subsistence agriculture, using fire as a means to clear the undergrowth once the large trees have been felled. Excessive and indiscriminate burning prevents forest regrowth and also impacts other key habitats. Regular burning also encourages the continuing spread of the invasive South American shrub *Vernonanthura polyanthes* which is now dominant over many hectares of disturbed, former forest habitats in the Chimanimani foothills, out-competing native species and preventing regeneration of natural habitats and encroaching into forest margins. A further threat is the impact of gold mining along some of the major rivers that flow from the massif, which pollutes the watercourses and also denudes fringing vegetation. Conservation action is urgently needed in this IPA, particularly in the area that falls outside the core CNP. Work with community leaders to attempt to better balance livelihoods with biodiversity conservation is ongoing, led by the Micaia Foundation, and this has led to the establishment of informal community conservation areas in the Maronga, Zomba and Mpunga communities (Timberlake et al. 2016); these areas are included within the core IPA delineation. Recently, plans have been mooted to cultivate coffee as a shade crop at Moribane Forest as part of a habitat restoration plan for the Chimanimani TFCA under the draft "Plano de Restauração paisagem de Chimanimani" (C. de Sousa, pers. comm. 2021). Such a scheme would need to be carefully managed and focused on degraded forest areas in order to prevent damage to the intact forest ecosystem.

The site is included within the Chimanimani Mountains Important Bird Area (IBA) and Chimanimani Key Biodiversity Area (KBA), both of which now include the whole of the CNP core and buffer zones—this site is noted to be probably the area of greatest avian diversity within Mozambique, although there are no endemic bird species (BirdLife 2021). The forests also have an important population of African Elephant (*Loxodonta africana*), these being most frequent at Moribane Forest Reserve. The IPA would qualify as an Alliance for Zero Extinction (AZE) site on the basis of the presence of *Ficus muelleriana* and *Streptocarpus acicularis*.

Site assessor(s)

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IPA criterion A species

SPECIES	QUALIFYING SUB-CRITERION	≥ 1% OF GLOBAL POPULATION	≥ 5% OF NATIONAL POPULATION	1 OF 5 BEST SITES NATIONALLY	ENTIRE GLOBAL POPULATION	SOCIO-ECONOMICALLY IMPORTANT	ABUNDANCE AT SITE
<i>Aloe ballii</i> <i>Reynolds var. makurupiniensis</i> <i>Ellert</i>	A(i)	✓	✓	✓	—	—	Unknown
<i>Gutenbergia westii</i> <i>(Wild) Wild & G.V.Pope</i>	A(i)	✓	✓	✓	—	—	Frequent
<i>Cyanotis chimanimaniensis</i> <i>Faden</i>	A(iv)	✓	✓	✓	—	—	Unknown
<i>Tephrosia longipes</i> Meisn. <i>var. swynnertonii (Baker f.) Brummitt</i>	A(iv)	—	✓	✓	—	—	Unknown
<i>Streptocarpus acicularis</i> <i>I.Darbysh. & Massingue</i>	A(i)	✓	✓	✓	✓	—	Scarce
<i>Englerina swynnertonii</i> <i>(Sprague) Polhill & Wiens</i>	A(iii)	✓	✓	✓	—	—	Unknown
<i>Ficus muelleriana</i> <i>C.C.Berg</i>	A(i)	✓	✓	✓	✓	—	Occasional
<i>Danthoniopsis chimanimaniensis</i> <i>(J.B.Phipps) Clayton</i>	A(i)	✓	✓	✓	—	—	Occasional
<i>Afrocanthium ngonii</i> (Bridson) <i>Lantz</i>	A(i)	—	✓	✓	—	—	Unknown
<i>Otiophora lanceolata</i> Verdc.	A(i)	✓	✓	✓	—	—	Frequent
<i>Vepris drummondii</i> <i>Mendonça</i>	A(i)	✓	✓	✓	—	—	Occasional
<i>Synsepalum chimanimani</i> <i>I.Darbysh. & S.Rokni</i>	A(i)	✓	✓	✓	—	—	Frequent
<i>Encephalartos chimanimaniensis</i> <i>R.A.Dyer & I.Verd.</i>	A(i)	✓	✓	✓	—	—	Scarce
<i>Kleinia chimanimaniensis</i> <i>van Jaarsv.</i>	A(iv)	—	—	—	—	—	Unknown

SPECIES	QUALIFYING SUB-CRITERION	≥ 1% OF GLOBAL POPULATION	≥ 5% OF NATIONAL POPULATION	1 OF 5 BEST SITES NATIONALLY	ENTIRE GLOBAL POPULATION	SOCIO-ECONOMICALLY IMPORTANT	ABUNDANCE AT SITE
<i>Coffea salvatrix</i> Swynn. & Phillipson	A(i)	✓	✓	✓	–	–	Occasional
<i>Crepidorhopalon flavus</i> (S.Moore) I.Darbysh. & Eb.Fisch.	A(i)	✓	✓	✓	–	–	Occasional
<i>Sericanthe chimanimaniensis</i> Würsten & De Block	A(i)	✓	✓	✓	–	–	Occasional
<i>Scleria pachyrrhyncha</i> Nelmes	A(i)	–	✓	✓	–	–	Unknown

IPA criterion C qualifying habitats

HABITAT	QUALIFYING SUB-CRITERION	≥ 5% OF NATIONAL RESOURCE	≥ 10% OF NATIONAL RESOURCE	1 OF 5 BEST SITES NATIONALLY	AREAL COVERAGE AT SITE
Low Altitude Moist Forest 100-600 m	C(iii)	–			
Medium Altitude Moist Forest 900-1400 m	C(iii)	–	–		

General site habitats

GENERAL SITE HABITAT	PERCENT COVERAGE	IMPORTANCE
Forest - Subtropical/Tropical Moist Lowland Forest	–	Major
Savanna - Moist Savanna	–	Major
Wetlands (inland) - Bogs, Marshes, Swamps, Fens, Peatlands [generally over 8 ha]	–	Minor
Rocky Areas - Rocky Areas [e.g. inland cliffs, mountain peaks]	–	Major
Artificial - Terrestrial - Subtropical/Tropical Heavily Degraded Former Forest	–	Major
Artificial - Terrestrial - Arable Land	–	Major
Wetlands (inland) - Permanent Rivers, Streams, Creeks [includes waterfalls]	–	Minor

Land use types

LAND USE TYPE	PERCENT COVERAGE	IMPORTANCE
Nature conservation	–	Major
Agriculture (arable)	–	Major
Tourism / Recreation	–	Minor

LAND USE TYPE	PERCENT COVERAGE	IMPORTANCE
Harvesting of wild resources	—	Minor

Threats

THREAT	SEVERITY	TIMING
Biological resource use - Logging & wood harvesting	Low	Ongoing - stable
Agriculture & aquaculture - Annual & perennial non-timber crops - Small-holder farming	High	Ongoing - increasing
Natural system modifications - Fire & fire suppression - Increase in fire frequency/intensity	High	Ongoing - increasing
Invasive & other problematic species, genes & diseases - Invasive non-native/alien species/diseases	High	Ongoing - increasing

Protected areas

PROTECTED AREA NAME	PROTECTED AREA TYPE	RELATIONSHIP WITH IPA	AREAL OVERLAP
Chimanimani	National Park	protected/conservation area overlaps with IPA	—
Chimanimani	Trans-Frontier Conservation Area (core zone)	protected/conservation area overlaps with IPA	—
Chimanimani	Trans-Frontier Conservation Area (buffer zone)	protected/conservation area overlaps with IPA	—
Maronga	Forest Reserve (production)	IPA encompasses protected/conservation area	—
Moribane	Forest Reserve (production)	IPA encompasses protected/conservation area	—
Zomba	Forest Reserve (production)	IPA encompasses protected/conservation area	—

Conservation designation

DESIGNATION NAME	PROTECTED AREA	RELATIONSHIP WITH IPA	AREAL OVERLAP
Chimanimani Mountains (Mozambique)	Important Bird Area	protected/conservation area overlaps with IPA	—
Chimanimani	Key Biodiversity Area	protected/conservation area encompasses IPA	—

Management type

MANAGEMENT TYPE	DESCRIPTION	YEAR STARTED	YEAR FINISHED
Protected Area management plan in place	Chimanimani National Reserve Management Plan (3 volumes).	2000	—

Bibliography

BirdLife International 2021. **Important Bird Areas factsheet: Chimanimani Mountains (Mozambique)**..

Timberlake, J.R., Darbyshire, I., Cheek, M., Banze, A., Fijamo, V., Massunde, J., Chipanga, H. & Muassinar, D. 2016. **Plant conservation in communities on the Chimanimani footslopes, Mozambique. Report prepared for Darwin Initiative Award 2380: Balancing Conservation and Livelihoods in the Chimanimani Forest Belt, Mozambique**..

Müller, T., Siteo, A. & Mabunda, R. 2005. **Assessment of the Forest Reserve Network in Mozambique**..

Ghiurghi, A., Dondeyne, S. & Bannerman, J.H. 2010. **Chimanimani National Reserve Management Plan (3 volumes)**.

Instituto Nacional de Geología 1987. **Carta Geológica, scale 1: 1 million**..

Rokni, S., Wursten, W. & Darbyshire, I. 2019. **Synsepalum chimanimani (Sapotaceae), a new species from the Chimanimani Mountains of Mozambique and Zimbabwe, with notes on the botanical importance of this area**.. *PhytoKeys*, Vol 133, page(s) 115-132