Republic of Mozambique
Ministry of Land and Environment

HISTORICAL VEGETATION MAP AND RED LIST OF ECOSYSTEMS ASSESSMENT FOR MOZAMBIQUE

Version 2.0 – Final Report

Led by:

Wildlife Conservation Society

COMBO

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FONDS FRANÇAIS POUR L'ENVIRONNEMENT MONDIAL

RED LIST OF ECOSYSTEMS

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Note:
The taxonomy follows that of the recent Trees and Shrubs Mozambique (Burrows et al. 2018) or online plant name search engines such as https://www.gbif.org/species/search, http://www.theplantlist.org/, http://www.mozambiqueflora.com/speciesdata/index.php, http://apps.kew.org/efloras, or http://www.ville-ge.ch/musinfo/bd/cjb/africa/recherche.php?langue=an

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GLOSSARY

Alluvium: (adj. Alluvial) Sedimentary material found in areas fringing river courses, composed of sand, clay, silt and pebbles transported and deposited by flowing floodwaters of the river over time.

Aquatic: Living in, or floating on, water.

Bamboo: Giant grasses with tough woody unbranched stems or culms; in Mozambique represented by Oxytenanthera abyssinica which often forms dense and extensive stands.

Basalt: A fine-grained, dark-coloured igneous rock of volcanic origin, typically composed of calcic plagioclase with pyroxene and olivine.

Bushveld: A local South African term or name mainly applied to various forms of well-wooded savanna vegetation.

Chalk: A white to greyish carbonate sedimentary rock that is a form of limestone mainly made up of the mineral calcite. It is soft, fine-grained and easily crushed and is composed of the shells of various types of minute marine organisms.

Chenier: A chenier is a long sandy ridge that is part of a coastal plain, known as a "chenier plain," consisting of cheniers (ridges) separated by intervening depressions of mudflats or sand deposits. Cheniers and associated chenier plains are associated with shorelines characterized by generally low wave energy, low gradient, muddy shorelines, and an abundant sediment supply which, in Mozambique, is deposited in the delta of the Zambezi River and its distributaries (adapted from Wikipedia).

Coast: (adj. Coastal) That part of the land that adjoins or is near to the sea.

Coral rag: A geological formation of surface limestone or calcareous rock derived from recent, petrified corals, often extremely broken or eroded into cavities and sharp edges; almost always close to the sea.

Dambo: Waterlogged, predominantly grass covered, depressions bordering headwater drainage lines found in miombo regions.

Deciduous: Usually of leaves, falling off at the end of the season of growth (compare Evergreen)

Dry: It is a relative term and dry is used in this work to indicate vegetation or areas that receive less than the average rainfall for the broader region. For the miombo units in Mozambique, dry was applied to vegetation units receiving less than 1000 mm per annum.

Endemic: In ecology, pertaining to a plant or animal species which is naturally confined to a particular, well-defined geographical region.

Epiphyte: A plant that grows on another plant, but which is not parasitic and only uses the other plant as perch to better obtain light, as well as it's nutrients from the host's bark and wind-blown detritus.

Escarpment: A long cliff or steep slope separating two comparatively level or more gently sloping surfaces; usually the sloping edges of a plateau or a range of mountains or hills.

Estuary: (adj. Estuarine): The tidal mouth of a large river, where the ocean tide meets the freshwater of the river. Estuaries are open to the sea and are tidal for their length, having a mixture of saltwater and freshwater.

Evergreen: Of plants that do not shed all their leaves simultaneously through the year.

Forest: A vegetation type with a ± continuous tree canopy and (usually) one of more understorey strata or layers, usually a sparse herbaceous layer and typically supporting woody climbers and epiphytes. Grasses are sparse or absent.

Gabbro: A dark, coarse-grained, slow-cooling igneous rock formed in plutons or batholiths deep below the earth's surface. Gabbro is the slow-cooled equivalent of fast-cooled basalts.

Geophyte: A perennial plant, often herbaceous, with its permanent parts buried below ground level, producing aerial parts which flower, fruit, and die back annually. The underground parts are commonly bulbs, corms or rhizomes, but may also be woody stems (see also Geoxylic suffrutex, below).

Geoxylic suffrutex: An 'underground tree'; a woody species with its stems, branches or 'rhizomes' developing below ground level, producing annual above-ground shoots which flower and fruit within one season. Typically, geoxylic suffrutices are species with close tree relatives of the same genus.

Gneiss: A banded, coarse-grained regional metamorphic rock rich in quartz and feldspar, commonly a metamorphosed granite, with a similar composition.

Graminoid: Referring to herbaceous plants with a grass-like form, usually with long narrow leaves, typically including plants such as grasses, sedges and rushes.

Granite: A coarse-grained igneous rock composed mainly of quartz, feldspar and mica and/or hornblende. Granite is the slow-cooled plutonic version of fast-cooled rhyolite.

Grassland: A single-layered vegetation type that is dominated by grasses or graminoids. Grasslands may contain many species of short woody plants, but grasses always predominate.

Ground layer: The lowest layer of a plant community, comprising especially ferns, mosses, lichens, and fungi, together with low-growing herb species and, in the case of woodlands, grasses.

Halophyte: (adj. Halophytic): A plant growing in salty environments, and which is able to tolerate high levels of salt in the soils or water.

Herbaceous: With the texture of a herb, soft and pliable, without a woody stem.

Inselberg: A prominent steep-sided smooth mountain, which rises above a ± flat surrounding plain. In Mozambique they are usually composed of weather-resistant granite or syenite.

Jesse, Jesse Bush: A type of deciduous thicket 1–4 m high, usually on sandy soils, and dominated by scrambling species of the genus Combretum and other genera in Combretaceae.

Klippe: Part of the Monapo geological complex, it includes phosphate rich apatite deposits.

Lagoon: A stretch of salt water or brack water separated from the sea by a low sandbank or coral reef.

Liane, Liana: A large, usually woody plant with long stems supported by, and climbing into the branches of trees. A climber is smaller than a liane and is woody or herbaceous.

Limestone: Sedimentary rocks formed by the chemical precipitation of calcium carbonate from calcium-rich water. Areas of limestone geology are often characterized by sinkholes and caverns.

Lithophyte: (adj. Lithophytic): A plant that grows on rocks (= epilithic)

Lowland: A comparative or relative term, without altitudinal parameters, describing areas at lower altitudes than highlands, mountains or plateaux.

Mangrove: 1. A coastal swamp or vegetation type that is regularly inundated by sea water; 2. A tree species adapted to these conditions, often furnished with breathing or prop-roots.

Miombo: A term used to describe a type of deciduous woodland widespread in south-central Africa and dominated by the tree genera Brachystegia, Julbernardia and Isoberlinia (Fabaceae: Detarioideae).

Mistbelt: A variable altitudinal belt experiencing frequent mists and fog and resulting precipitation created by an ascending moisture-laden airflow, commonly occurring along eastern and southern mountain slopes and escarpments.

Moist: The term moist is a relative term, and in this work, it is used to indicate vegetation or areas that receive more than the average rainfall, when compared to the broader regional area. For the Mozambique miombo units, all areas with a mean annual rainfall of more than 1000 mm were classified as moist.

Montane: Of, or relating to, mountains, usually referring to the upper reaches or summits of mountains.

Palm savanna: A poorly drained open grassy savanna with scattered tree and shrubs but with palms (Hyphaene, Phoenix, Borassus) dominant or characteristic.

Papyrus: A large sedge (Cyperus papyrus) of tropical regions, usually growing in water and forming extensive tangled masses known as sudd.

Parasite: An organism that lives off or in another organism, often at the expense of the host organism. In plants, a plant that obtains its water and all its nutrients from its host plant, usually without killing its host.

Plateau: (pl. Plateaux): A plateau is a flat, elevated landform that rises sharply above the surrounding area on at least one side.

Pyric: A vegetation type resulting from, induced by, or associated with regular burning (fires).

Pyrophyte: A plant adapted to survive severe fires.

Rhyolite: A silica-rich extrusive igneous rock, formed from the magma of volcanic eruptions. The fine-grained brown or dark grey rock typically contains phenocrysts of quartz, biotite, hornblende, pyroxene, feldspar, or amphibole.

Riparian: Of, inhabiting, or situated on, the bank of a river or stream (= Riverine).

Riverine: Relating to, or situated on, a river or riverbank (= Riparian).

Rubber: A substance produced from the commercially harvested latex of Landolphia kirkii (Apocynaceae) in Mozambique but superseded, firstly by Pará Rubber (Hevea brasilensis), and now by synthetic rubber.

Samphire: a name given to a number of succulent salt-tolerant plants (halophytes) that tend to be associated with water bodies.

Sandstone: A sedimentary rock formed of fine to coarse sand, usually quartz, that have been either compacted or cemented together by various substances such as silica, calcium carbonate, iron oxide, or clay.

Savanna: A confused or controversial term of various definitions. Here used to indicate a wooded vegetation type of various density and canopy heights, but always dominated by C4 grasses with low or tall trees and evolved and maintained by the pressures of browsing/grazing herbivores, as well as fire. The savanna climate is characterised by a hot wet season alternated with a warm dry season. It includes Woodland.

Scarp forest: Forest that is mainly confined to the steep or gentle slopes of an escarpment; see also Escarpment.

Subtropical: Relating to an area that is close or adjacent to tropical parts of the world, i.e., outside the Tropic of Cancer and the Tropic of Capricorn.

Swamp: A wetland permanently saturated or filled with water and dominated by trees. Swamps may be freshwater, seawater, or intermediate (brack water).

Thicket: A very dense vegetation type usually formed by low and tall shrubs (3–6 m) with some emergent trees. Grass layer usually absent.

Trophic: A trophic level refers to a level or a position in a food chain; a trophic savanna indicates vegetation types that support a diversity of heterotrophs (organisms that cannot manufacture their own food and are consumers in trophic webs, like decomposers, detrivore, herbivores and predators). These savannas are usually nutrient rich, and the tree species evolved to withstand browsing, so they may have spines to deter browsing.

Tropical (adj.): Of, being, or characteristic of a region or climate that is hot and humid and is frost-free with temperatures high enough to support year-round plant growth given sufficient moisture; a region within the Tropics.

Tropics: Region north and south of the Equator between the Tropic of Cancer in the north, and the Tropic of Capricorn in the south.

Understorey: Any layer or stratum of vegetation below the canopy or uppermost layer.

Wetland: Land where the water table is, periodically or permanently, at or above the land surface for long enough to promote the formation of waterlogged soils and the growth of aquatic plants.

Wooded grassland: A vegetation type experiencing a single dry season of more than 4 months, usually composed of only a few sparse trees species and a crown cover of less than 40%. The diversity is in the herbaceous layer, not the tree layer. Often included under the definition of Savanna.

Woodland: A denser form of Savanna, and in this work, it describes a tree-dominated vegetation type with a canopy of similar height and usually devoid of thorny species. Examples include mopane and miombo woodland. Woody climbers and epiphytes are absent or scarce.

Xerophyte: (adj. Xerophytic): A plant that is adapted to dry or arid habitats.

SUMMARY

Mozambique has been facing a rapid economic development and human population growth, which has resulted in considerable conversion of natural habitat, especially forests, to agricultural areas or degraded grasslands. Unfortunately, the country's biodiversity is yet to be adequately studied and assessed. One of the gaps is the inexistence of a historical ecosystem map at a fine enough scale for use in conservation planning purposes. Therefore, there is urgent need to have such a product, which could be used to undertake a red listing of ecosystems according to the criteria established by the International Union for the Conservation of Nature.

The current report summarises the methods and findings of the work undertaken to produce a detailed map of Mozambique's historical vegetation and the correspondent Red Listing of Ecosystems, including detailed ecological descriptions of the 162 ecosystem types and summaries of the assessment.

The map was developed by a group of regional and national experts, who implemented an innovative approach by using a suite of existing information, including old maps, combined with modern mapping tools. A first set of technical discussion meetings and a broader workshop were conducted to agree on the vegetation units and their classification. The presented vegetation map represents a significant improvement on the number of vegetation types identified, compared to 1955 (113 units) and 1967 (52 units) maps, as well as the scale of the vegetation map. It can be adequately used at an estimated scale of 1: 250 000 and is suitable for use in conservation planning and related assessments.

All 162 ecosystem types were assessed under the IUCN Red List of Ecosystems criteria A, B and D. Overall, 193,293 km^2 (24.5%) of Mozambique's terrestrial area has been converted to human land uses (agriculture and urban areas), leaving approximately 593,720 km2 (75.5%) of natural areas remaining in at the end of 2020. Applying the IUCN RLE criteria to Mozambique's terrestrial ecosystems resulted in an initial classification of 7 Critically Endangered (4.32%), 15 Endangered (9.25%), and 62 Vulnerable ecosystems (38.2%; Table 3.1; Figure 3.1). Spatially, threatened ecosystems are concentrated in coastal regions as well as many inland parts in the mid and north of Mozambique.

These results are disturbing and clearly show that the establishment of retention targets is urgent. There needs to be an increase in conservation efforts to reverse this situation and slow the trajectory towards ecosystem collapse. Conservation planning will be important to identify specific conservation priorities to reduce the loss of biodiversity and risk of ecosystem collapse.

The current map and report will go through a process of analysis by the KBA and Red Listing National Coordination Group before being submitted to IUCN for validation. In parallel, it should be endorsed by the Government of Mozambique as the country's official map of threatened ecosystems. That final product will be key for the adjustment of the national conservation targets to the new CBD Global Biodiversity Framework for the period 2020-2030.

Northern inselberg forest

1. INTRODUCTION

1.1 Background

Mozambique is a biodiverse country with over 6,000 flora species and 4,200 fauna species identified so far. These occur in a significant variety of terrestrial, marine and freshwater ecosystems (MITADER, 2015). Over the past 10 years, the country has faced an increasing economic development, with strong investment in megaprojects and infrastructure. Mining (coal and minerals), oil & gas, agriculture (mainly commercial large-scale), forestry (forest plantations of exotic species and selective logging of native species) and fisheries were the sectors that developed the most, posing considerable pressure and impacts of natural ecosystems and biodiversity. Furthermore, the illegal exploitation of forest and wildlife and mineral resources are major threats to biodiversity conservation in Mozambique (MITADER, 2015). Nevertheless, human population growth and expansion has increased pressure on natural resources causing more detrimental impacts on the ecosystems.

For example, a recent study on deforestation in Mozambique (MITADER, 2018a) shows that the current forest area is estimated at 34 million hectares in comparison with 40 million hectares in the early 90's, and that the current average deforestation based on the analysis of the period 2003 to 2013 is 269,000 hectares per year (+/-12,000 hectares/year). The provinces with the highest average annual deforestation in the country are Nampula, Zambezia and Manica and the provinces with the lowest average annual deforestation are Maputo, Gaza and Inhambane. Deforestation is more frequent where the Miombo formations are predominant. The main causes of this phenomenon are agriculture, which contributes about 86% of the annual deforestation and the conversion of forests to grasslands with 13% resulting from logging for wood fuel and timber purposes. The conversion of forests to human settlements was only 0.1%.

The information above shows how rapidly the landscape is changing in the country. The Program Conservation, Impact Mitigation and Biodiversity Offsets (COMBO+ see http://combo-africa.org/) started its implementation in Mozambique in 2016 by the Wildlife Conservation Society (WCS) in partnership with several international partners and the Foundation for the Conservation of Biodiversity (BIOFUND), with the objective of supporting the Government (Ministry of Land and Environment – MTA) to reconcile economic development with biodiversity conservation, by improving its capacity to adequately implement the mitigation hierarchy.

The adoption, by the Government, of adequate conservation priorities derived from robust spatial planning, which should be informed by sound data based on internationally recognised approaches, is key to achieve such an outcome. It is crucial for the adequate implementation of the mitigation hierarchy, as well as for the identification of Critical Habitats under the International Finance Corporation's Performance Standard 6, that threatened species are properly documented and critical sites for conservation mapped and known. COMBO+ has been supporting the Government of Mozambique to develop the adequate tools to determine avoidance areas from the biodiversity perspective, as well potential biodiversity offset areas.

The United States Agency for International Development (USAID), through the SPEED+ Project "Supporting the Policy Environment for Economic Development", recognised such need and funded the project "Red List of Threatened Species, Identification and Mapping of Key Biodiversity Areas (KBAs) in Mozambique", which started in February 2019. This project was led by WCS Mozambique working closely with the National Red List Working Group alongside with the National Directorate for Environment (DINAB). DINAB is a directorate under the Ministry of Land and Environment and, among other responsibilities, coordinates and oversees the implementation of the National Biodiversity Strategy and Action Plan (NBSAP).

The project conducted a Key Biodiversity Areas (KBAs) assessment for the whole country, which resulted in the identification of 29 terrestrial and marine KBAs (WCS et al. 2021) and a global red list assessment of endemic and near endemic fauna species. In addition,

it initiated the development of an updated historical ecosystem map for Mozambique. This exercise started by involving national and regional institutions, namely the National Agricultural Research Institute (IIAM), the University Eduardo Mondlane (UEM), the National Fund for Sustainable Development (FNDS), the National Institute for Fisheries Research (IIP), BIOFUND, the project "Conservation and equitable use of biological diversity in the SADC region - SECOSUD II", the South African National Biodiversity Institute (SANBI) and the Royal Botanical Gardens at Kew, to create synergies and discuss a consensual approach. To undertake this activity an expert working group on ecosystems was established, mostly comprised of regional and national specialists, with the objective of developing a historical vegetation map, which could be used to undertake a Red Listing of Ecosystems that could then inform the Key Biodiversity Areas assessment.

The project was implemented in three phases. The first two were funded by SPEED+ and the third by the French Development Agency (Agence française de développement - AFD) and the French Facility for Global Environment (Fonds français pour l'environnement mondial - FFEM), through the COMBO+ program.

The first phase was exploratory and lasted between February 2019 and June 2020. It was assumed, from the beginning of the project, that resources and time would not be enough to complete a comprehensive Red List of Ecosystem assessment as input into the KBA process. However, it was foreseen to establish a preliminary list of ecosystems found within the country, using one or more existing maps as an interim measure. The idea was to classify the ecosystems using a hierarchical approach, where some classes would be more finely identified than that of others, for example mangroves, to develop a preliminary historical ecosystem map. Then, using existing landcover maps, the Red List of Ecosystems criteria would be applied as best as possible to preliminarily identify ecosystems that are of conservation concern which could likely trigger KBA status. Due to the size of the country and complexity of the analyses that were carried out it was only possible to map the South of the country till the end of the project (June 2020). The importance of this tool led the donor to fund a second phase, carried out between October 2020 and February 2021, with the objective of completing the work that had started in the previous phase, developing a first version of the new detailed historical ecosystem map for Mozambique and the corresponding Red List of Ecosystems assessment.The map and assessment were considered as preliminary (version 1.0), because the development of a final version would require more expert input and subsequent validation by the KBAs and Red List National Coordination Group.

The third phase was implemented between July 2021 and March 2023 and included a series of technical meetings (5 meetings in total) with the national experts to confirm the boundaries and nomenclature of the proposed ecosystem types. This information was used by the authors to improve the maps, the description of each ecosystem and the corresponding graphs. In addition, a process for conducting and national Red Listing of Ecosystems was implemented through the organization of 3 online workshops with national specialists.

The current report corresponds to version 2.0 of the report, which can now be considered complete. It includes both the description of all historical vegetation units that have been identified for Mozambique and the results of the Red Listing of Ecosystems. This final version should be approved by the National Coordination Group for KBAs and Red Lists and submitted to the Government of Mozambique for endorsement as the official historical vegetation map and red list of ecosystem assessment for the country. The report should also be submitted to the IUCN to be approved as a formal RLE assessment. It should be highlighted that the map and red list assessment will be "live" documents, which should be updated at least every 10 years or whenever data that might significantly change the content of the document is gathered for the country.

Central montane forest

1.2 The ecosystems of Mozambique: an overview

Mozambique is a long country that stretches some 2000 kilometres, from 10° 30' South, to 26° 51' South. Two-thirds of the country comprises a coastal plain that gradually rises from the Indian Ocean westwards to the eastern escarpment of the great Central African plateau which, along most of Mozambique's western border, is composed of a disjunct string of mountains and escarpments, reaching the country's highest points at Mt Binga in the Chimanimani Mts (2436 m), Tsetserra Mt (2278 m), and the inselberg mountain of Namuli (2419 m). However, the great majority (71%) of Mozambique lies below 500 m while 23% lies below 100 m above sea level (Figure 1.1).

The climate in the northern coastal areas is affected by the seasonal influence of the Indian Ocean monsoon rains, the effect lessening further south down the coast, partly due to the interruption caused by the islands of Madagascar, the Comores, and the Seychelles. Temperatures are warmest near the coast, compared with colder temperatures higher inland. The average annual temperature for Mozambique varies between 23.9°C and 26.9°C (Figure 1.2), while the temperature range fluctuates annually between 10.5°C and 21.6°C per annum (https://www.worldclim.org/). The high montane regions of Manica Province experience intermittent frosts at night during the winter months while across Mozambique the minimum temperature drops to between 3.9°C and 16.3°C during the coldest month.

Rainfall in the central and southern parts of Mozambique is controlled largely by the movement of the Intertropical Convergence Zone (ITCZ) from the north during summer and the frequent cyclones from the east, both of which contributed to the summer rainfall, together with regular convectional thunderstorms. Precipitation varies widely throughout the country (Figure 1.2), ranging between 361 and 2251 mm per annum (https://www.worldclim.org/). Most of Mozambique is humid and warm, while the valleys of the Zambezi-Shire rivers, and the Upper Buzi, Save and Limpopo rivers experience a long hot and dry season, with an average annual rainfall of between 450 and 810 mm. Precipitation is greatest throughout the north and in the central region east of the Shire River, where it ranges between 1010 and 1780 mm; the highest precipitation, averaging more than 1700–1800 mm, is in the western highlands and in coastal pockets around Beira and Quelimane. The southern end of the Choa escarpment is predicted to have the highest rainfall of just above 2200 mm. The semi-arid southern regions receive a rainfall of only ± 75 mm per month in the wet season from November to February and almost none in the dry season between April and October. Although summer rainfall may be high, large parts of Mozambique receive very little rain during the driest quarter of the year which places considerable water stress on plants (including unirrigated crops).
In the north of Mozambique, the geology is largely comprised of metamorphic igneous rocks, primarily of gneiss, while in the south the geology is much younger with quaternary deposits of unconsolidated sediments overlying sedimentary rocks. A wide belt of dune sands occurs along the southern coast. The predominant geology has resulted in extensive areas of sandy soils across much of Mozambique (Figure 1.3). Generally speaking, areas with clay to loam soil and a dry winter climate are unable to support the establishment of forests. However, in Mozambique, in areas with a dry climate, forests and thickets are able to establish on deep sandy soils.

The great majority of Mozambique is covered in woodlands of various composition and density, ranging from seasonally arid deciduous open woodlands with little species dominance apart from scattered pure stands of mopane (Colophospermum mopane), to closed-canopy miombo woodlands at altitudes of up to 1400 m or more and receiving up to an annual average of 1500 mm rainfall.

The term 'miombo' is a widespread colloquial name given to woodlands dominated by the genera in the Fabaceae: Detarioideae of Brachystegia, Julbernardia, Berlinia and Isoberlinia. In Mozambican miombo woodland, the first two genera dominate, particularly Julbernardia globiflora and Brachystegia spiciformis which, to a greater or lesser degree, constitute perhaps 70% of the woodlands of Mozambique, frequently in association with the genera of Uapaca, Monotes, Pericopsis and Pterocarpus. Miombo woodland extends roughly from the Limpopo River in the south (± 24° South) northwards throughout Mozambique, and from sea-level, to 1800 m a.s.l. along the mountains of the west. It is therefore the single most important woodland type in Mozambique.

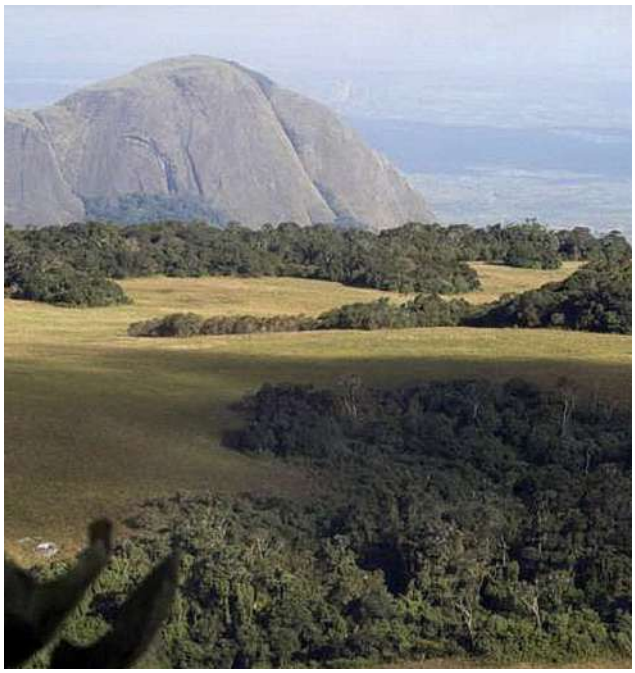
All Mozambique's woodlands are subjected to regular fires during the dry season (June–October), occasionally ignited by lightning but, most often, set by people to improve grazing. Miombo is a fire-derived woodland and its main constituents (Brachystegia, Julbernardia) are regarded as fire-tolerant (thick bark, bud protection, leaf drop) although exceptionally hot late-season fires may kill some individuals. Almost all the ground flora in miombo is reliant upon fire to stimulate flowering and therefore seed production.

True forests are fire-sensitive or fire-intolerant, they do not have a grass understorey, and are relatively limited in extent, being confined to discontinuous patches along the coastal belt, or on the rain-bearing slopes of the mountains and inselbergs of western and central Mozambique where they are supported by orographic rain, some of which may fall during the winter months. Montane forests are characterized by an abundance of epiphytes and a generally lower canopy height, whereas the low-altitude forests generally lack epiphytes and have a canopy height of 25–35 m tall. The most common coastal forest is a mosaic of dense coastal thicket or low coastal forest, sometimes interspersed with low miombo woodland which reaches down to the coast. In places, such as on the Cheringoma Plateau, these woodlands and forests are supported by frequent early-morning coastal mists and are characterized by numerous epiphytes.

Pure grasslands are relatively rare in Mozambique. The high summits of the western escarpment, where it spills across into Mozambique from neighbouring Zimbabwe, are covered in areas of montane grassland, often dotted with woody species. Montane grasslands are scarce in Mozambique north of the Zambezi River where they are confined to a few high (above 1300 m) mountain ranges or massifs.

Along the southern coastal belt, south of the Save River and parallel to the coast, run a series of ancient sand dunes which, often on their crests, occurs extensive areas of grassland, sometimes pure but often dotted with woody trees and shrubs, and almost always with an abundance of geoxylic suffrutices (underground trees). In the valleys or slacks between these old dunes, or behind the existing fore-dune, occur scattered lakes or large pans, of either brack or freshwater. They are usually surrounded by extensive wetlands or hygrophilous grasslands, some of which may be dry in winter or inundated in summer.
Mangroves are an important feature of the Mozambique coastline, being best-developed and most extensive in the deltas or on either sides of the mouths of the country's major rivers (Maputo, Save, Buzi, Zambezi, Ligonha, Lurio) and in some of the larger bays and around the Quirimba Islands in the north. Behind some of these deltas are extensive salt flats (e.g Save and Zambezi rivers), some of which are inundated when the rivers flood in summer.

Chitonga montane wooded grassland



Namuli montane grassland

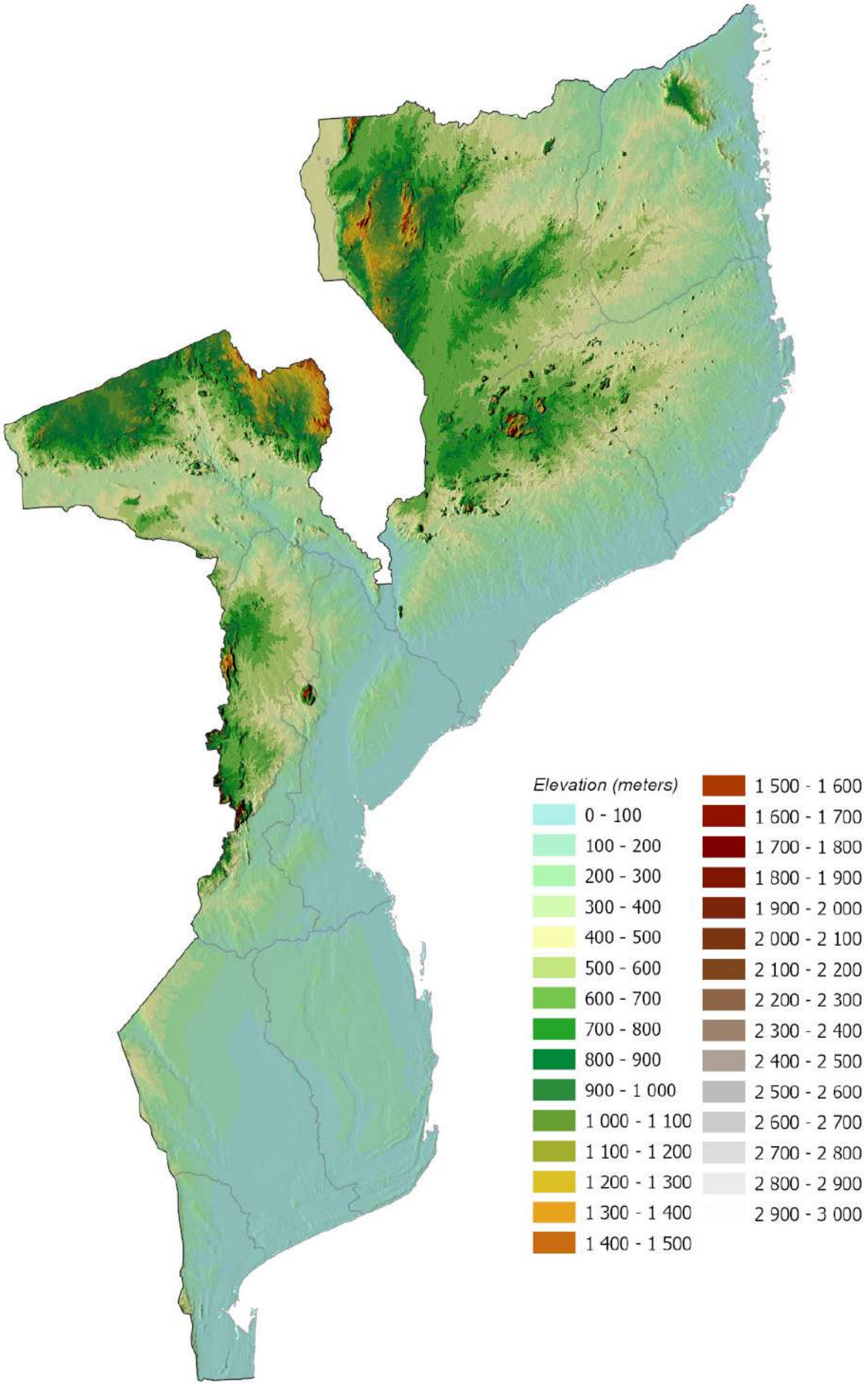


Figure 1.1 – Major climatic gradients across Mozambique.

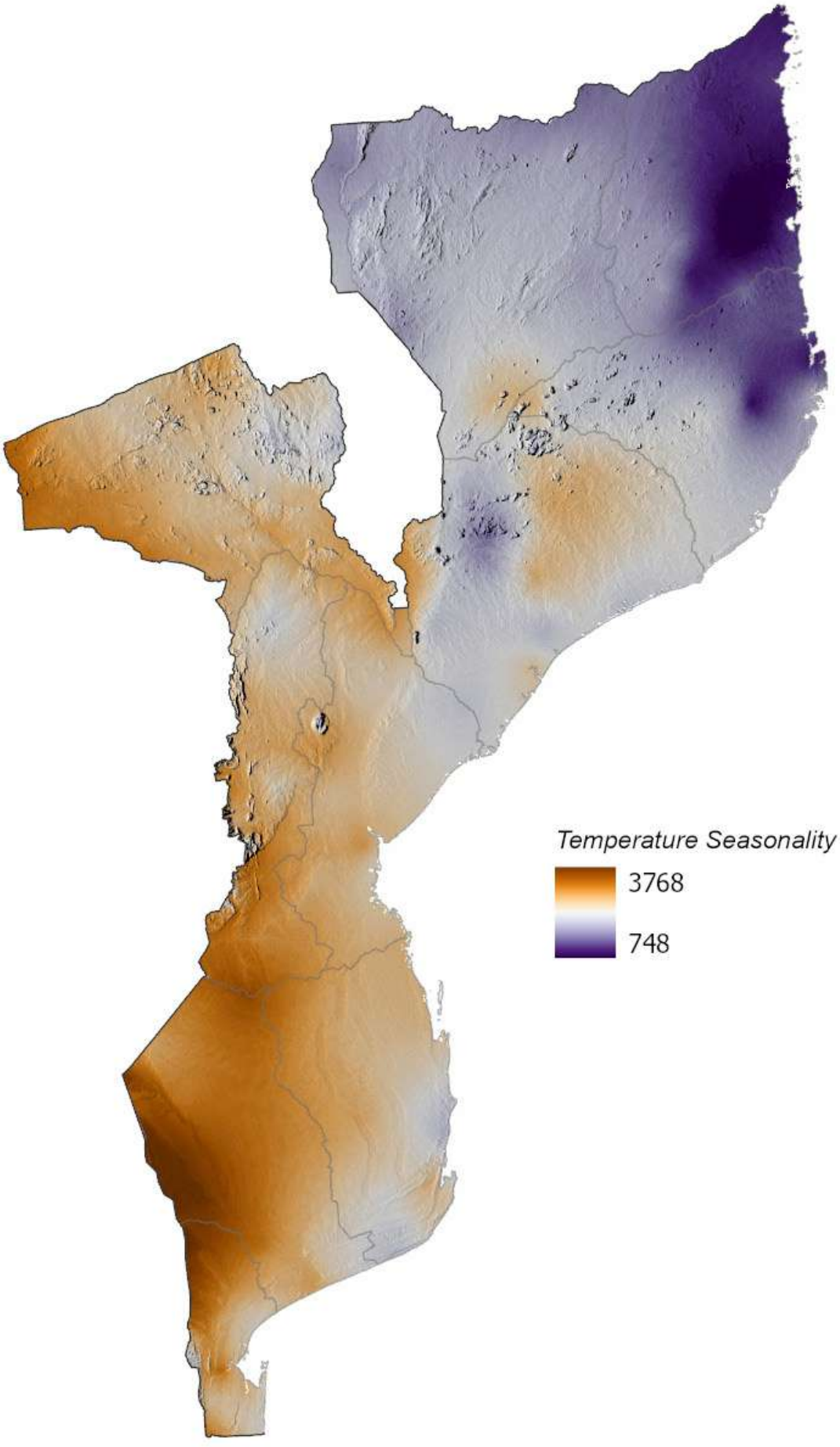


Figure 1.2 – Major climatic gradients across Mozambique.

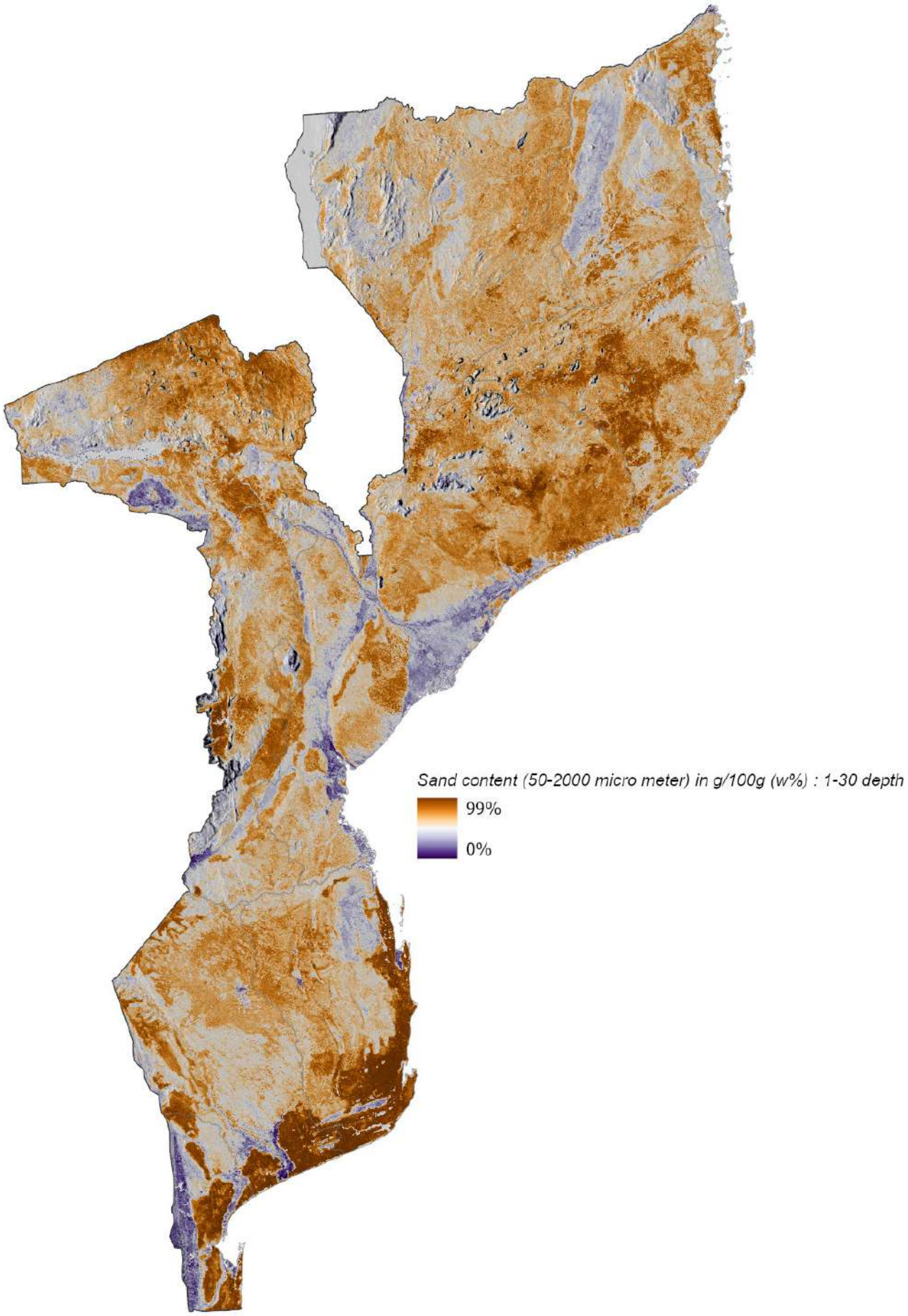


Figure 1.3 – Sandy soils of Mozambique, expressed as a percentage at a depth of 1 – 30 cm

1.3 Introduction to the IUCN Red List of Ecosystems

The IUCN Red List of Ecosystems (RLE) aims to support conservation in resource use and management decisions by identifying ecosystems most at risk of loss or collapse (Keith et al., 2015, 2013). Similar to the IUCN Red List of Threatened Species, the outcome of an RLE assessment is a list of ecosystems and their status for a region (Figure 1.4) (Rodríguez et al., 2015). Because the RLE was developed to promote a consistent framework suitable for assessing and monitoring the status of ecosystems, it enables comparisons of collapse risk between countries, locations and ecosystem types (Keith et al., 2013).

For further information on the development of the RLE protocol, the theory and scientific foundations upon which they were developed, and detailed information on the purpose of each of the five criteria refer to the Guidelines for the application of IUCN Red List of Ecosystems Categories and Criteria (Bland et al., 2017).

More information on the IUCN Red List of Ecosystems, is available in multiple languages on the IUCN Red List of Ecosystems website (www.iucnrle.org).

Assessments of ecosystem types (commonly termed 'assessment units' within Red List of Ecosystems assessments) are conducted by applying five criteria and their associated thresholds, enabling each ecosystem type to be classified according to their risk of collapse (termed 'status'). To ensure the assessment process is transparent and repeatable, each ecosystem type is clearly described according to the IUCN Red List of Ecosystems guidelines (Bland et al., 2017). This standard approach of applying the IUCN Red List of Ecosystems Categories and Criteria to clearly described ecosystems is critical to allow for accurate, comparable and repeatable assessments of ecosystems status and to contribute to the global IUCN Red List of Ecosystems programme.

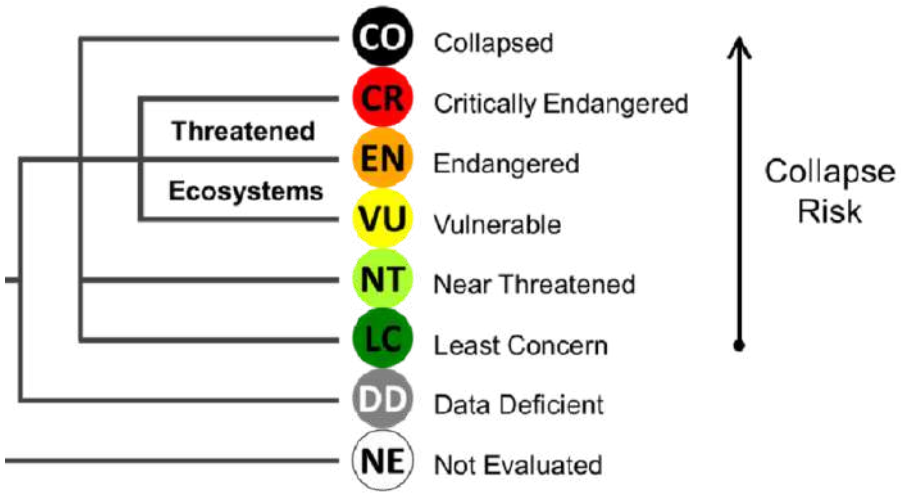


Figure 1.4 – The IUCN Red List of Ecosystems categories, indicating the status of ecosystems. Threatened ecosystems are those assessed as Vulnerable, Endangered, or Critically Endangered. Source: (Bland et al., 2017)

1.3.1 Definitions

There are several key concepts that must be clearly defined to allow for repeatable ecosystem risk assessments:

Risk

Risk is defined as the probability of an adverse outcome over a specified timeframe. Here, the adverse outcome is the endpoint of ecosystem decline, which the RLE terms ecosystem collapse.

Ecosystem collapse

Understanding the concept of ecosystem collapse is critical for interpreting IUCN RLE assessments. For the purposes of the RLE, "an ecosystem is Collapsed when it is virtually certain that its defining biotic or abiotic features are lost from all occurrences, and the characteristic native biota are no longer sustained. Collapse may occur when most of the diagnostic components of the characteristic native biota are lost from the system, or when functional components (biota

that perform key roles in ecosystem organisation) are greatly reduced in abundance and lose the ability to recruit." According to the IUCN guidelines (Bland et al., 2017), risks to ecosystems can be caused by a variety of threatening processes that are expressed through different symptoms of ecosystem collapse. The RLE risk model groups these symptoms into four major types, which ultimately form the RLE criteria (Figure 1.5).

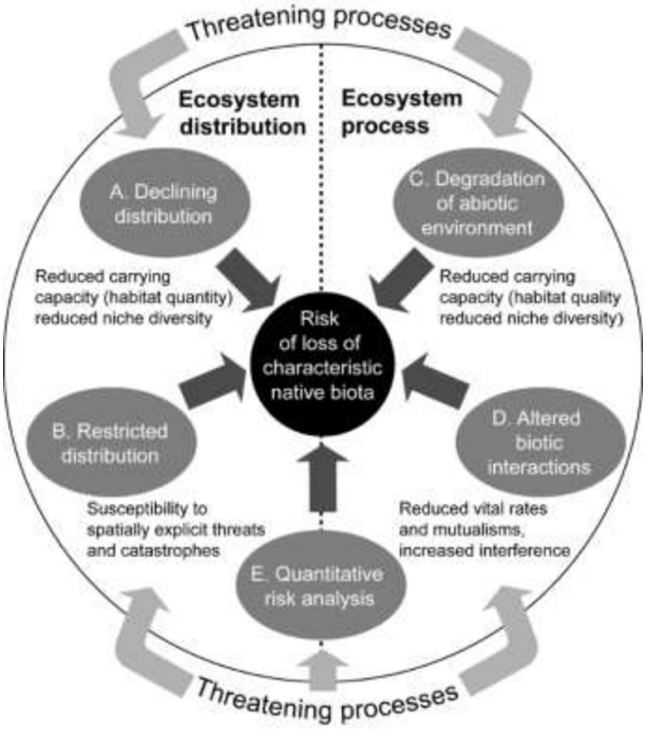


Figure 1.5 – The IUCN Red List of Ecosystems risk assessment model. Source: (Bland et al., 2017)

For more information on the concept of collapse and how to identify when an ecosystem is collapsed, we recommend referring to the IUCN Red List of Ecosystems guidelines, which describes this in detail (Bland et al., 2017a; Bland et al., 2018). Ecosystem collapse has not been assessed at this stage and therefore it is not presented in this report.

Time frames

Because risks must be assessed over specified time frames, a standard set of time frames are carefully defined in the IUCN Red List of Ecosystems Categories and Criteria. There are four specified time frames used in the RLE:

- The historical past. We notionally use the year 1750, which marks the onset of industrial scale exploitation of ecosystems.
- The recent past. This is the past 50 years (1970-2020), which is considered long enough to distinguish directional change from natural variability;
- Any 50-year period including the recent past, present and future. Predictions and inferences based on past declines, simulation models and any other model considered suitable for assessing risks into the future may be used;
- The future. Again, predictions are required to assess risks over this time frame and are usually based on models that use information about the response of ecosystems to threatening processes

1.3.2 IUCN Red List of Ecosystems Categories and Criteria

IUCN Red List of Ecosystems Criteria

To assess the risk of ecosystem collapse, each ecosystem is assessed under five rule-based criteria that form the IUCN Red List of Ecosystems Criteria. These criteria were developed following nearly a decade of scientific work focused on understanding pathways of ecosystem decline, degradation, loss and collapse (Bland et al., 2017; Keith et al., 2018, 2015, 2013; Murray et al., 2018, 2017; Nicholson et al., 2009; Rodríguez et al., 2015, 2011). Importantly, they relate the symptoms of ecosystem decline with the risk that an ecosystem will lose its defining features. The five criteria were designed to target different symptoms of ecosystem collapse (Figure 1.5). These symptoms are both distributional and functional:

- Criterion A: declines in distribution, which reduce carrying capacity for dependent biota;
- Criterion B: restricted distribution, which predisposes the system to spatially explicit threats;
- Criterion C: degradation of the abiotic environment, reducing habitat quality or abiotic niche diversity for component biota
- Criterion D: disruption of biotic processes and interactions
- Criterion E: allows for the integration of the above four symptoms into a simulation model of ecosystem dynamics to allow quantitative estimates of the risk of ecosystem collapse.

For further information on the criteria refer to the Guidelines for the application of IUCN Red List of Ecosystems Categories and Criteria (Bland et al., 2017).

Categories

Applying thresholds (decision rules) for each of the IUCN RLE criteria enables each ecosystem to be assigned to a category of risk ('status'). An ecosystem assessed under the RLE criteria can be placed into eight categories: Collapsed (CO), Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT), Least Concern (LC), Data Deficient (DD), and Not Evaluated (NE; Figure 1.5). The first six categories (CO, CR, EN, VU, NT and LC) are ordered in decreasing risk of collapse. The categories Data Deficient and Not Evaluated do not indicate a level of risk.

For further details of the categories refer to the Guidelines for the application of IUCN Red List of Ecosystems Categories and Criteria (Bland et al., 2017). We applied version 2.2 of the IUCN Red List of Ecosystems Criteria (Table 1.1).

Table 1.1 – The IUCN Red List of Ecosystems Criteria, Version 2.2. (Source: Bland et al., 2017)

A. Reduction in geographic distribution over **ANY** of the following time periods:				
		CR	**EN**	**VU**
A1	Past (over the past 50 years)	≥ 80%	≥ 50%	≥ 30%
A2a	Future (over the next 50 years)	≥ 80%	≥ 50%	≥ 30%
A2b	Any 50 year period (including the past, present and future)	≥ 80%	≥ 50%	≥ 30%
A3	Historical (since approximately 1750)	≥ 90%	≥ 70%	≥ 50%

B. Restricted geographic distribution indicated by **ANY OF** B1, B2 or B3:				
		CR	**EN**	**VU**
B1	Extent of a minimum convex polygon (km^2) enclosing all occurrences (extent of occurrence, EOO) is no larger than: **AND** at least one of the following (a-c): (a) An observed or inferred continuing decline in **ANY** of: i. a measure of spatial extent appropriate to the ecosystem; **OR** ii. a measure of environmental quality appropriate to characteristic biota of the ecosystem; **OR** iii. a measure of disruption to biotic interactions appropriate to the characteristic biota of the ecosystem (b) Observed or inferred threatening processes that are likely to cause continuing declines in geographic distribution, environmental quality or biotic interactions within the next 20 years.	≤ 2,000 km^2	≤ 20,000 km^2	≤ 50,000 km^2
	(c) Ecosystem exists at:	1 threat-defined location	≤ 5 threat-defined locations	≤ 10 threat-defined locations
B2	The number of 10 × 10 km grid cells occupied (area of occupancy, AOO) is no more than: **AND** at least one of a-c above (same as for B1).	≤ 2	≤ 20	≤ 50
B3	The number of threat-defined locations is very small (generally fewer than 5) **AND** prone to the effects of human activities or stochastic events within a very short time period in an uncertain future, and thus capable of Collapse or becoming Critically Endangered (CR) within a very short time period (B3 can only lead to a listing as **VU**).			**VU**

C. **Environmental degradation** over **ANY** of the following time periods:		Relative severity (%)		
		Extent (%)	≥ 80	≥ 50	≥ 30
C1	The past 50 years, based on change in an abiotic variable affecting a fraction of the extent of the ecosystem and with relative severity, as indicated by the following table:	≥ 80	CR	EN	VU
		≥ 50	EN	VU	
		≥ 30	VU		
		Extent (%)	≥ 80	≥ 50	≥ 30
C2	**C2a.** The next 50 years, based on change in an abiotic variable affecting a fraction of the extent of the ecosystem and with relative severity, as indicated by the following table; **OR**	≥ 80	CR	EN	VU
	C2b. Any 50-year period including the past, present and future, based on change in an abiotic variable affecting a fraction of the extent of the ecosystem and with relative severity, as indicated by the following table:	≥ 50	EN	VU	
		≥ 30	VU		
		Extent (%)	≥ 90	≥ 70	≥ 50
C3	Since 1750 based on change in an abiotic variable affecting a fraction of the extent of the ecosystem and with relative severity, as indicated by the following table:	≥ 90	CR	EN	VU
		≥ 70	EN	VU	
		≥ 50	VU		

D. **Disruption of biotic processes or interactions** over **ANY** of the following time periods:		Relative severity (%)		
		Extent (%)	≥ 80	≥ 50	≥ 30
D1	The past 50 years based on change in a biotic variable affecting a fraction of the extent of the ecosystem and with relative severity, as indicated by the following table:	≥ 80	CR	EN	VU
		≥ 50	EN	VU	
		≥ 30	VU		
		Extent (%)	≥ 80	≥ 50	≥ 30
D2	**D2a.** The next 50 years, based on change in a biotic variable affecting a fraction of the extent of the ecosystem and with relative severity, as indicated by the following table; **OR**	≥ 80	CR	EN	VU
	D2b. Any 50-year period including the past, present and future, based on change in a biotic variable affecting a fraction of the extent of the ecosystem and with relative severity, as indicated by the following table:	≥ 50	EN	VU	
		≥ 30	VU		
		Extent (%)	≥ 90	≥ 70	≥ 50
D3	Since 1750, based on change in a biotic variable affecting a fraction of the extent of the ecosystem and with relative severity, as indicated by the following table:	≥ 90	CR	EN	VU
		≥ 70	EN	VU	
		≥ 50	VU		

E. **Quantitative analysis that estimates the probability of ecosystem collapse to be:**	
CR	≥ 50% within 50 years
EN	≥ 20% within 50 years
VU	≥ 10% within 100 years

1.3.3 Assessment process

Application of the IUCN Red List of Ecosystems Categories and Criteria follows a generic sequential process, but for Mozambique the steps included:

- Developing a comprehensive ecosystem map for Mozambique's terrestrial environment. This process is guided by experts and local stakeholders, and the result is a map and list of ecosystem types, and an ecosystem typology consistent with the IUCN global ecosystem typology;
- Describing each of the ecosystem types in ecosystem typology following the standard approach detailed in the Guidelines for the application of IUCN Red List of Ecosystems Categories and Criteria (Bland et al., 2017);
- Applying the assessment criteria to each ecosystem type, which requires extensive data searches and analyses. The outcome of each ecosystem assessment consists of a status of the ecosystem under 5 criteria and 18 subcriteria of the IUCN Red List of Ecosystems categories and criteria;
- Compiling the results into a comprehensive IUCN Red List of Ecosystems for the area of assessment (this report), which describes each ecosystem and identifies ecosystems according to their risk of collapse. This report details each of these steps in the following sections.

1.4 Methods

1.4.1 Overview

The development of the historical ecosystem map and report was comprised of three phases that were implemented between February 2019 and March 2023. The sections below described the methodology undertaken, which included the creation of a National Experts Advisory Group that was consulted throughout the project . Several meetings and workshops were undertaken throughout this period, as explained in section 1.4.3 - Ecosystem Mapping.

The Mozambique National Ecosystem Assessment required the development of an ecosystem typology that lists the individual assessment units (ecosystems) to be assessed under the IUCN Red List of Ecosystems categories and criteria (Bland et al., 2017).

Developing the ecosystem typology for Mozambique included:

- Review suitability of historic ecosystem maps for Mozambique;
- Workshop to present intent and proposed methodology with national experts to ensure support and inclusion of ideas and concepts, and any additional datasets;
- Development of ecosystem map took just under 2 years to complete;
- More than 200 hours of field work to identify ecosystem types and their characteristic species composition;
- Consultations with national experts to adjust the map and ecosystem classification;
- Cross-walking the list of ecosystems identified in Mozambique with the newly developed global hierarchical ecosystem typology, Version 2.0 (Keith et al., 2020);

Following the development of the ecosystem typology, a red list assessment of each ecosystem was conducted, and these methods are outlined later in this document.

To facilitate sharing and quick access to the information, the vegetation/ecosystem map was published on the ArcGIS Online platform, and then using ArcGIS Experience Builder an open-access webmap was created displaying information about each vegetation/ecosystem unit in a side panel including photographs, climate diagrams, and all associated text.

The webmap mentioned above has been made available online at the Biodiversity Information System for Mozambique (SIBMOZ at http://sibmoz.gov.mz), the national biodiversity web portal. SIBMOZ includes a subpage dedicated to ecosystems and another to the red

1 This group was initially created as the Ecosystem Technical Working Group under the project Red List of Threatened Species, Ecosystens, identification and mapping of Key Biodiversity Areas (KBAs) in Mozambique and it was later expanded for the purpose of the current project.

listing of ecosystems. A database with all ecosystems described in this report is available at SIBMOZ and it contains the main characteristics of each of the 162 ecosystems types.

The ecosystem map was also converted to a mobile map package that can be visualised within a mobile app. Any user can now view and query the ecosystem map of Mozambique, and all the associated information on a mobile device, even if the device is offline in the field. The mobile package is available to download from within the mobile application ArcGIS Field Maps (compatible with both iOS and Android systems), available on Google Play and iTunes. This functionality is particularly important in supporting the implementation and interpretation of the ecosystem map in the field (Figure 1.6).

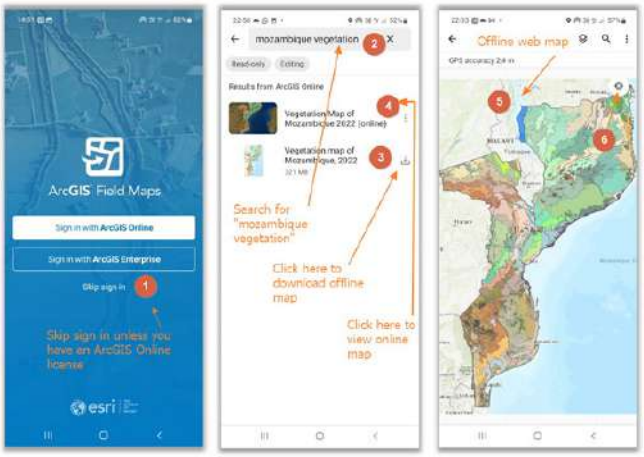


Figure 1.6 –Mozambique vegetation/ecosystem map on a mobile device, using the ArcGIS Field Maps application.

1.4.2 Ecosystem Typology

Literature Review

The main authors of the proposed ecosystems completed a book on the woody flora of Mozambique in 2018 (Burrows et al. 2018). Being familiar with the vegetation of Mozambique, they considered the availability of various vegetation maps and information. Although several local or regional vegetation maps or classifications have been produced over the years, only the Wild & Barbosa (1967) and Pedro & Barbosa (1955) vegetation maps provided a national coverage (Figure 1.7). Unfortunately, they are known to have some limitations and inaccuracies, as well as the scale of mapping is too broad for use for conservation planning or Red List of Ecosystem (RLE) Assessments, which is understandable given the technology available in the 1950s and 60s.

The availability of supporting datasets, such as plant distribution records used in the recently published Trees and Shrubs of Mozambique (Burrows et al. 2018), georeferenced herbarium specimens, and the national forest inventory (MITADER 2018b), supported the possibility of revising the Wild & Barbosa vegetation map published 53 years ago. The urgency for developing a national Red List of Threatened Ecosystems was the ultimate catalyst for revising the vegetation map for Mozambique, which would be the proxy for ecosystem types used in the Red List assessment.

Expert consultation

As described in section 1.4.3 – Ecosystem Mapping, the national experts were consulted to contribute to the improvement of the ecosystem typology and gather data on known occurrences of each ecosystem type to support the ecosystem mapping component of the assessment. These experts also assisted in the review and translation of the English names into Portuguese.

Field work

The authors of the vegetation map relied heavily on the field trips conducted while working on the book on the woody flora of Mozambique. No additional field trips were conducted but they collated all the herbarium locality information and databased records used in the distribution map, together with information from the National Forest Inventory and GBIF (GBIF 2021), to assist in delineating and describing the vegetation units. 1178 photographs were sourced and georeferenced to assist with interpreting the satellite imagery and to

Tropical salt marshes

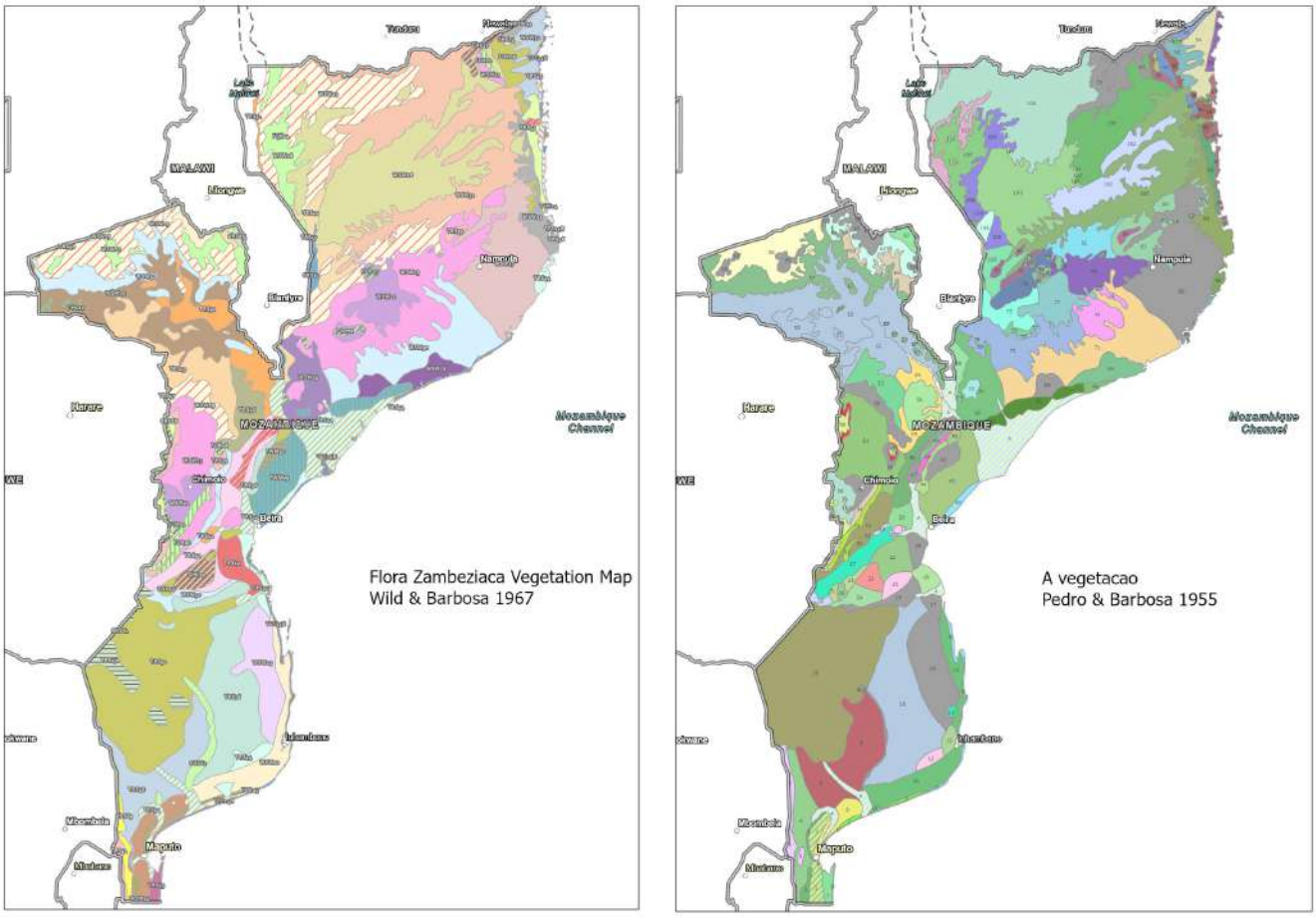


Figure 1.7– Historic vegetation maps of Mozambique by (left) Wild & Barbosa (1967) and (right) Pedro & Barbosa (1955)

1.4.3 Ecosystem Mapping

To develop a map of the ecosystems of Mozambique, we used a supervised and expert delineated approach, although this approach was broken up into three phases, where in phase 1 there was a reliance upon machine learning algorithms to allocate all areas to one of the proposed initial vegetation types. The naming and initial classification hierarchy was based on a strict vegetation classification.

The ecosystem map was therefore based on the vegetation classes, and when cross-walked with the IUCN Typology, resulted in 162 ecosystems, which resulted in 6 realms (level 1), 8 biomes (level 2), 15 functional ecosystem types (level 3), 32 regional ecosystems (level 4), and 162 ecosystems (level 5). The approach to the map development is detailed below.

A National Expert Advisory Group was created to support the development of the map and the Red List assessment. The full list of meetings and workshops held is presented in Table 1.2

Rovuma basin forest

Table 1.2 – List of the main technical meetings and workshops held to improve the historical vegetation map of Mozambique and apply the red listing of ecosystems.

Date	Topic/Purpose	Type of consultation	Nr of attendees
	First Phase (February 2019 to June 2020)		
19-Apr-19	First meeting with the Ecosystems working group to discuss the approach for improving the Historic Vegetation Map and undertake the Red Listing of Ecosystems	Technical Meeting	15
9 to 10-Oct-19	Technical Workshop at Buffelskloof, Mupumalanga, South Africa with 3 ecosystem specialists to develop the vegetation map for Mozambique	Technical Workshop	5
11-Nov-19	Ecosystem Working Group technical meeting to discuss the preliminary vegetation map produced (covering only the southern part of the country) and to agree on the degradation map to be used in the Red List assessment.	Technical Meeting	12
	Second Phase (October 2020 to February 2021)		
09-Oct-2020	Technical Kick off meeting (Second phase of KBA&RL Project), to discuss the Methodology to complete the development of Mozambique's revised historical vegetation map and to run the red list of ecosystem assessment, as well to present main progress to date and to define next steps.	Technical Meeting	16
23-Oct-2020	Specific meeting with mangrove specialists to discuss the approach for the Mozambique Mangrove Map, to be integrated into the global historical ecosystem map, and define the next steps.	Technical Meeting	7
13-Nov-2020	Technical meeting with ecosystems working group to present and discuss the first draft of the historical vegetation map covering the entire territory of Mozambique and define the way forward.	Technical Meeting	14
17- Dec-2020	Technical meeting to discuss the first feedbacks given to the draft map, as well as to present the main progress made to date, and define the way forward.	Technical Meeting	15
21-Jan-2021	Coordination meeting to prepare for the technical workshop on revising the vegetation map.	Coordination Meeting	5
22-Jan-2021	Technical Workshop (in virtual and in-person mode) to present and review the draft of vegetation map with the broader stakeholders.	Technical Workshop	31
28-Jan-2021	Working session with national experts to continue the process of reviewing the vegetation units on the draft map, and to propose the names in Portuguese of the vegetation units	Technical Meeting	14
4-Feb-2021	Meeting with the National Forestry Directorate to discuss about the engagement of the institution's technicians on the project.	Coordination Meeting	7
8-Feb-2021	Working session with national experts to continue the process in proposing the Portuguese names of the vegetation units and discuss about the applicability of the Forest Landscape Integrity Index (FLII) in the Mozambican context to be applied on the RLE assessment.	Technical Meeting	13
	Third Phase (July 2021 to March 2023)		
12-Aug-2021	Webinar to present improvements and changes to Mozambique historical vegetation/ ecosystem map (Version 1.0), according to the feedback received.	Technical Meeting	23
3-Sep-2021	Technical webinar to review the proposed national names for each vegetation unit / terrestrial ecosystem	Technical Meeting	15
11-April- 2022	Technical meeting with SANBI to share and discuss the cross-walk of the south African terrestrial ecosystem classification and map with the IUCN classification system (IUCN Typology), and possible lessons learned useful for Mozambique's terrestrial ecosystem cross-walk	Technical Meeting	7
5-May-2022	Technical webinar with national experts, to present the updated version of the Mozambique's terrestrial ecosystem map.	Technical Workshop	25
19-Aug- 2022	Technical webinar to discuss with the experts the general approach to apply the IUCN RLE criteria	Technical Meeting	15
15-Nov-2022	Technical webinar to present the first results of the IUCN RLE assessment.	Technical Workshop	20

Principles informing the development of the vegetation map

The first step was to define the general principles to be followed to develop the new ecosystem map:

- Establish a working group of national and international experts who could support the development of the map;
- Build on the strengths of existing vegetation maps, such as Wild & Barbosa (1967) and Pedro & Barbosa (1955), by maintaining those vegetation unit concepts that are supported by more recent field information;
- Build on the field knowledge and experience of the authors of the recently published book on the trees of Mozambique, and regional and national specialists, in splitting, merging or creating new ecosystem units;
- Endeavour to map the historical extent of vegetation types as best as possible so as to be able assess loss of ecosystems. To do so the authors considered the historic vegetation maps as well as the earliest suitable Landsat 1-3 imagery (1972-1983);
- Consider edge-matching with adjacent and more recent vegetation maps from surrounding countries to create a more cohesive vegetation map for the broader region
- To map at a scale of 1: 250 000 or finer so that resulting ecosystems can be used in fine-scaled conservation planning and offset projects;
- Utilise existing species datasets by collating all available georeferenced plant species distribution records to infer or visualise local vegetation communities in poorly-known areas;
- Utilise new GIS technologies, such as Random Forest, and available GIS datasets to classify poorly known areas;
- Validate the resulting map and vegetation unit names by national specialists through a process of comments, workshops and meetings;
- Update the map and vegetation unit names.

Phase 1: Supervised classification of expert identified vegetation units

The purpose of Phase 1 was to create a draft vegetation map for the entire Mozambique that would then serve as the basis for a more thorough review (Phases 2 and 3). This phase involved several steps discussed below:

1.1. First Technical meeting with the National Expert Advisory Group to discuss the development of a historical ecosystem map for Mozambique.

On 25 April 2019, the first ecosystem working group technical meeting was held with Mozambican specialists from different institutions (FNDS, IIAM, UEM-FAEF, SECOSUD II and BIOFUND), with the support from WCS's spatial planning team and other international specialist (Figure 1.8). The meeting had the objective of discussing the proposed approach, which included: i) confirm that the Flora Zambeziaca map would be the one to use as a baseline; ii) that this map would need to be updated to have the level of detail which is necessary to apply the Red List of Ecosystems assessment; and iii) that this improved map should be recognized as the historical vegetation/ ecosystem map of Mozambique;

1.2. Collating georeferenced species information

Various datasets were sourced and incorporated into a GIS database to assist in inferring, visualising, or modelling local ecosystem patterns in poorly known areas. These datasets also included species locality information to assist in delineating units and writing up the species accounts for each ecosystem unit. The datasets included, but were not limited to:

- Trees of Mozambique book database of plant distribution records for maps (n=7556)
- National Forest Inventory Plot data from 2007 and 2018 (n=41 183)
- National Herbarium of The Netherlands (WAG, n=6 821)
- Global Biodiversity Information Facility (GBIF, n=53 758)
- Buffelskloof Herbarium (BNRH, n=4 063)

1.3. Create a fine-scaled national coverage of Ecological Land Units (ELUs)

A false-colour Landsat 7 satellite map from the year 2000, with a pixel size of 150 x 150 m, was used as in input layer into a segmentation tool that divided Mozambique up into thousands of small planning units, or Ecological Land Units (ELUs), which share a similar spectral reflectance within a remote sensing image. Figure 1.9 is an extract for the Inhamitanga area with the black lines showing the boundary for each ELU. The minimum ELU size was set to 3000 ha which resulted in a final coverage of 10 581 units with an average size of 7 452 ha. The result was a set of ELUs that are ecologically similar and share a similar vegetation structure, and most likely share a similar species composition.

Figure 1.8 - The first ecosystem national expert advisory group technical meeting.

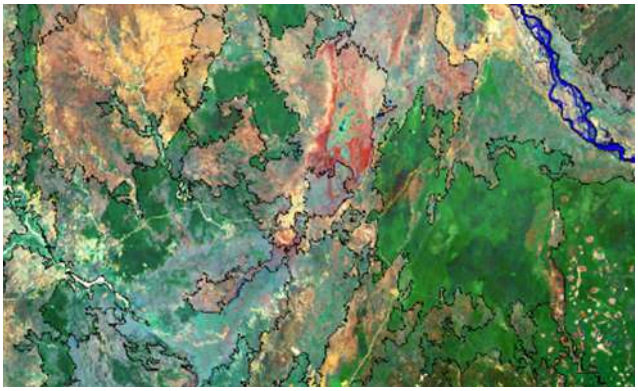


Figure 1.9– Ecological Land Units (ELUs) created through segmentation using a Landsat 7 satellite image from 2000.

1.4. Assigning environmental variables to each Ecological Land Unit

Next, we sourced or created a number of environmental GIS layers, such as altitude or canopy tree density, and then calculated the average value for each variable for each ELU and added these values to the ELU's attribute table. So, for each ELU we knew the value of its environmental variables. The environmental variables were sourced to cover many aspects that could either assist in identifying vegetation communities, such as tree canopy cover (Hansen et al. 2013), NDVI, individual Landsat bands, etc., or their adaptation to abiotic variables such as elevation, temperature, soil texture, soil nutrients, etc. For some variables, such as soil texture and soil nutrients, a multitude of individual GIS layers were available for each variable at various soil depths, which necessitated the need to simplify or summarise soil variables using Principal Component Analysis (PCA). PCA was used to extract the majority of the variation from the first three axes which were then used as individual synthesised layers (axes) in our analysis. For example, there were 14 soil nutrient variables (Hengl et al. 2015) that could be summarised into 3 axes. The 7 soil texture layers could similarly be summarized into 3 axes (Figure 1.10)

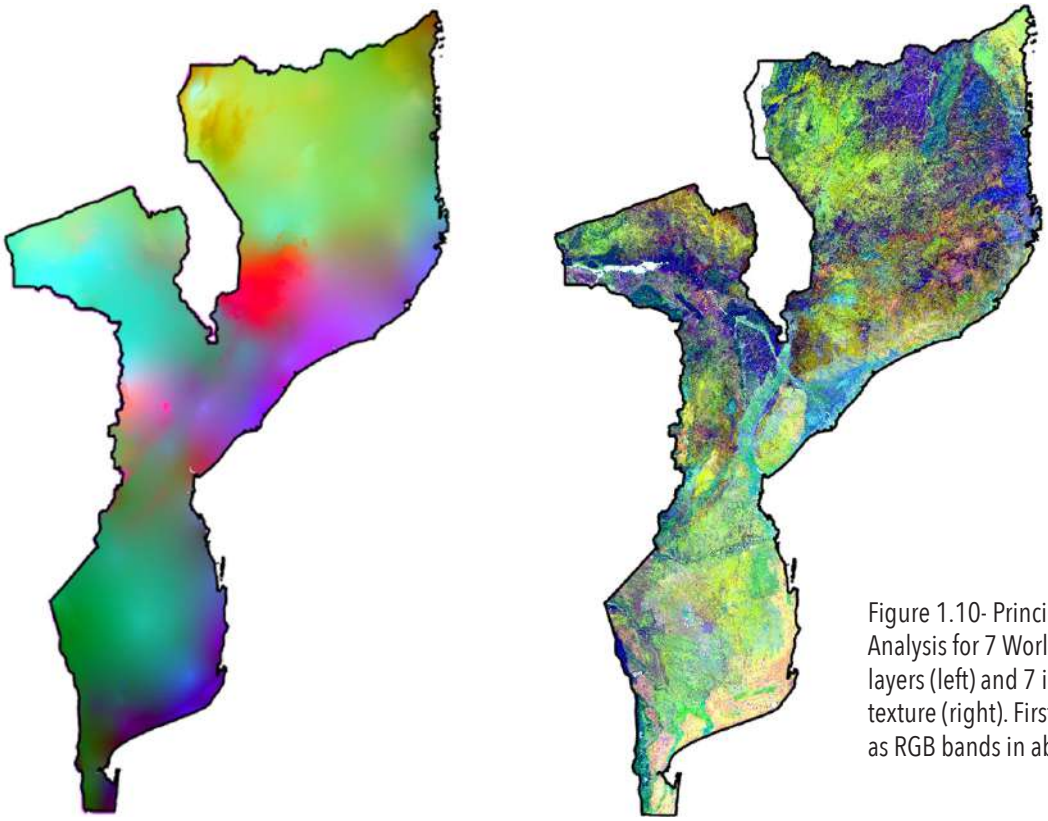


Figure 1.10- Principal Component Analysis for 7 WorldClim precipitation layers (left) and 7 input layers for soil texture (right). First 3 axes are visualised as RGB bands in above images.

As the 1967 Wild & Barbosa vegetation map of the Flora Zambesiaca area is probably the most widely used vegetation map in Mozambique, for each ELU we determined in which Flora Zambesiaca vegetation map unit it occurred, and this was added to the attribute table. The list of the 24 variables is provided in Table 1.3.

1.5. Developed a training dataset of typical vegetation types based on expert knowledge and existing classifications

A training dataset was created of what the authors perceived to be typical or characteristic vegetation types based on expert knowledge or other classifications such as Burrows et al. 2018, Wild & Barbosa (1967) and Pedro & Barbosa (1955). Numerous other more localised vegetation classifications were also considered as well as ecosystem maps from adjacent countries. This training dataset comprised point features and was considered to be a draft classification that could then be more widely consulted. A total of 4 792 training samples were created across Mozambique to represent the various vegetation types.

1.6. Classify all ELUs into proposed vegetation types using Random Forest

The training dataset covered many of the ELUs. However, more than half were not covered at all, so we used the random forest algorithm to predict ELUs without training points based on the value of each unit's environmental variables. Random forest is a very powerful predictor that identifies which environmental variables are driving the variation in the training dataset and applies that to predict ecosystem types in the unknown ELUs.

The Forest-based Regression Prediction geoprocessing tool within ArcGIS Pro 2.5 was used to run the random forest algorithm. The model output was considered reasonably accurate with a reported accuracy of 81%.

Table 1.3 – List of 24 environmental variables calculated for each ELU

Count	Environmental Variables	Source
1	Annual NDVI for year 2000 using Landsat 7	WCS
2	Seasonality: summer minus winter using NDVI 2000	WCS
3	Tree cover for year 2000:	Hansen 2000
4	Landsat spectral signature for red band	Esri
5	Landsat spectral signature for green band	Esri
6	Landsat spectral signature for blue band	Esri
7	Altitude (Digital Elevation Model)	SRTM 90m
8	Ruggedness: range in altitude over 1 km using 90m DEM	Derived from DEM
9	Solar Radiation: calculated over 180 days	Derived from DEM
10	Topographical Positional Index (100 km neighbourhood using 90 m DEM)	Derived from DEM
11	Slope in degrees	Derived from DEM
12	Mean Annual Temperature	Bioclim
13	Isothermality	Bioclim
14	Precipitation - PCA axis 1 (95.71% of variation)	Bioclim (Annual, Wettest Month, Driest Month, Coefficient of Variation, Wettest Quarter, Driest Quarter, Coldest Quarter)
15	Precipitation - PCA axis 2 (4.08% of variation)	
16	Soil nutrients - PCA axis 1 (89.92% of variation)	Soil Grid, 14 input layers
17	Soil nutrients - PCA axis 2 (7.09% of variation)	Soil Grid, 14 input layers
18	Soil nutrients - PCA axis 3 (2.98% of variation)	Soil Grid, 14 input layers
19	Soil texture - PCA axis 1 (95.87% of variation)	Soil Grid, 7 input layers
20	Soil texture - PCA axis 2 (3.99% of variation)	Soil Grid, 7 input layers
21	Soil texture – PCA axis 3 (1.33% of variation)	Soil Grid, 7 input layers
22	Distance to coast	GIS derived
23	Latitude	GIS derived
24	Vegetation Map of the Flora Zambesiaca Area	Wild & Barbosa 1967

Figure 1.11 shows the variable importance values for the 24 environmental variables used in the analysis. Variable importance values explain how important each environmental variable was in explaining or influencing the output of the derived random forest prediction. Because we ran the algorithm 100 times, and it is a random process, for each run the variable importance value may be slightly different and the box plot (below) helps to show the importance and variability of each environmental variable.

In descending order of importance, the top 10 most important environmental variables were: Flora Zambesiaca vegetation classification 29.44%, Latitude 27.88%, Temperature 26.45%, Distance from coast 24.06%, Precipitation PCA axis 2 23.97%, Isothermality 23.85%, Precipitation PCA axis 1 21.655, Altitude 21.39%, Soil nutrients PCA axis 2 20.84%, and Soil nutrient PCA axis 1 19.93%.
The result was a draft vegetation map for Mozambique based on the training dataset and its proposed classification. This was the foundation for the next phase which involved a detailed expert review of these concepts and finer scale digitising.

It is important to highlight that the 1967 Flora Zambesiaca map was a very robust classification and many of its boundaries should be discernible within the newly derived vegetation map, although the boundaries will now be much more accurately mapped and several units may be split if they straddled large diverse areas. The authors also applied their minds to this classification given their knowledge of this area and other vegetation classifications, resulting in deviations from the original Flora Zambesiaca vegetation map.

1.7. Technical Workshop to discuss progress and way forward regarding draft vegetation map from Phase 1

In early October 2019, the coordination team and three of the specialists working on the ecosystem map (Mervyn Lötter, John Burrows and Jonathan Timberlake) undertook a short workshop held at Buffelskloof, Mpumalanga, South Africa. This was due to the specialists not being available to travel to Mozambique. Hugo Costa (the project manager) and Muri Soares (FNDS specialist member of the Ecosystem Working Group) attended the workshop. At this 2-day event (9 to 10 October), Mervyn Lötter presented the technical work he had developed to improve the vegetation map using Random Forest and received feedback from these specialists (Figure 1.12). The discussions resulted in a preliminary improved ecosystem map for Mozambique. During the following weeks, Mervyn Lötter shared a WebGIS with the remaining ecosystem working group members to collect their comments and inputs to improve the map. Some comments were provided and Mervyn Lötter continued to work on the improvement of the draft vegetation map.

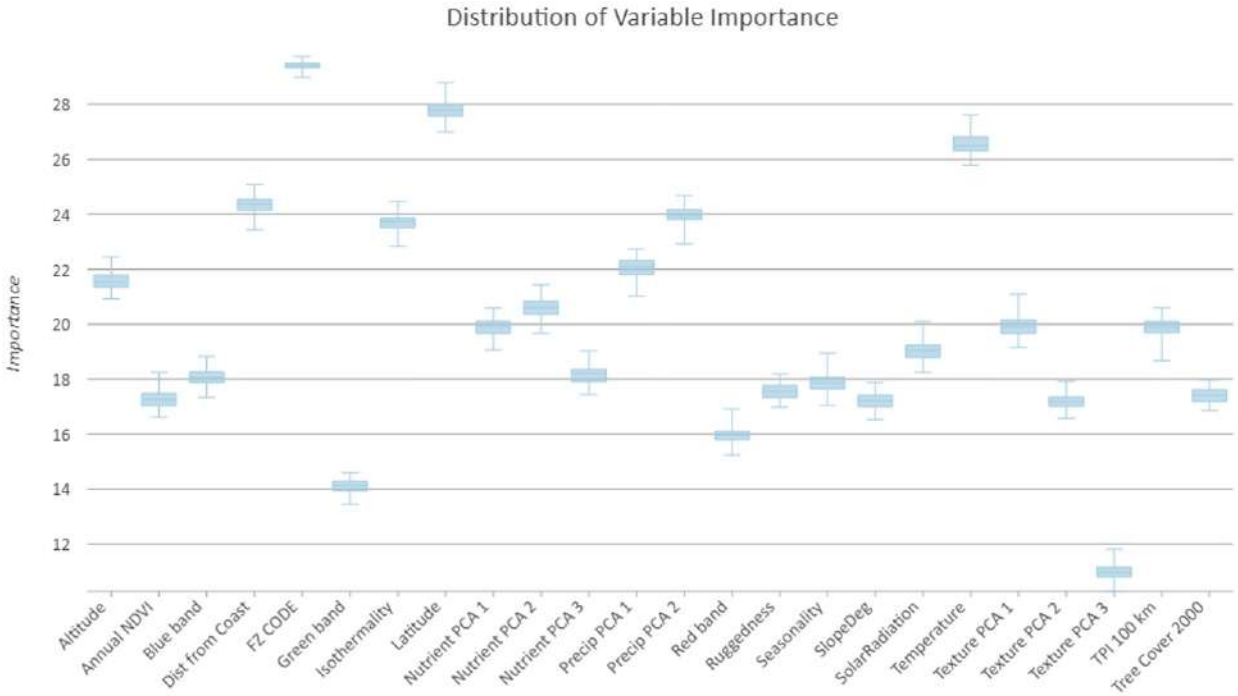


Figure 1.11– Box plot of variable importance values following 100 runs of the Forest-based Regression & Prediction geoprocessing tool

Figure 1.12– Technical Workshop for the Reclassification of Flora Zambeziaca map

Figure 1.13– Second ecosystem national expert advisory group technical meeting

1.8. Second Technical meeting of the Ecosystem working Group

A second technical meeting with the Ecosystem specialists was held in 11 of November 2019 at WCS office to discuss the preliminary ecosystem map for southern Mozambique and how its loss would be calculated in order to apply criteria A and B of the red list of ecosystems assessment. The meeting was attended by 14 people from different institutions such, UEM, FNDS, BIOFUND, IIAM, including WCS spatial planning experts (Figure 1.13).

Phase 2: Refining proposed classification and incorporating smaller vegetation types

The vegetation map from Phase 1 was considered a very rough early draft of the proposed vegetation map. The concepts and boundaries needed to be revisited and refined. Species localities and over 1100 georeferenced photographs were also considered in refining boundaries and concepts. This phase included the incorporating additional GIS datasets representing vegetation communities, as well as the onscreen digitising of many vegetation communities. Overall, Phase 2 took considerably more time than Phase 1 and resulted in significant improvements to the proposed vegetation map. Phase 2 also led to significant improvement on the scale of mapping as every units' boundaries were edited and improved. Once completed, climate diagrams were created for each unit to assist in interpreting similarities or differences between vegetation units. These units were proxies for the ecosystems that were then assessed using the guidelines for the red list of ecosystems.

2.1. Incorporating additional datasets into map and digitising polygons

Several GIS datasets were incorporated and hard-wired into the proposed vegetation map, or vegetation units were more accurately digitised on-screen to improve mapping accuracy of the previously 'segmented' ELUs. This approach was very time consuming but significantly improved the overall quality of the map. The additional datasets included were the Dry Ironwood forest (FNDS 2019), the WWF mangroves (Shapiro 2018), inselbergs modelled using Topographical Positional Index, dune forests, coral rag thickets, grasslands, forests and grasslands of Mt Ribaue (Montfort & Grinand 2020a) and Mt Namuli (Montfort & Grinand 2020b), montane forests, seashore vegetation, salt marshes, etc. The availability of an accurate geological map of Mozambique (Grantham et al. 2010) and detailed local vegetation studies were used to refine the unit concepts and boundaries (Beilfuss et al. 2001; Cunliffe 2002; Cunliffe 2012; Müller 2006; Osborn et al. 2019; Stalmans & Wishart 2005; Stalmans & Beilfuss 2008; Stalmans & Peel 2010; Timberlake et al. 1993; Timberlake et al. 2009; Timberlake et al. 2011; Wursten 2013).

2.2 Expert review

A multi-scale webmap was created in ArcGIS online and shared with the National Expert Advisory Committee with a means of exploring, reviewing and commenting on the vegetation map. The webmap included additional supporting datasets as well the historic vegetation maps and the 1178 georeferenced photographs covering more than half of all the vegetation units. They were also provided with a shared copy of the draft vegetation descriptions using Google Sheets which allowed for shared comments, which were incorporated into the vegetation map.

The national experts reviewed the vegetation units, with respect to the concept, boundaries or mapping

accuracy, missing data or alternative data sets, and the names of the units (both in English as well as their translation into Portuguese). The experts also provided inputs on the vegetation and species descriptions.

2.3. Stakeholder workshop to present the draft ecosystem map on 22 January 2021

In order to ensure further engagement, and a comprehensive and inclusive review of the draft map showing the historical vegetation of Mozambique, a technical workshop with several experts and stakeholders was held on January 22, 2021 (Figure 1.14). Due to the state of emergency in response to the COVID-19 pandemic, the number of in-person participants at the workshop was quite limited, and subject to all COVID-19 preventive measures. A total of about 16 experts participated in this technical workshop in the in-person mode and 15 attended in the online mode. The list of workshop participants can be found in Annex 2)

Three days before the workshop, the Terms of Reference, the vegetation descriptions and the login details to access the web map were shared, giving the participants the opportunity to analyse these elements in advance and prepare for the workshop. Background presentations were made by Mervyn Lotter at the workshop, addressing the following topics: i) purpose of the map; ii) the authors and their involvement in Mozambique; iii) previous vegetation maps (Wild & Barbosa, Pedro & Barbosa); iv) the methodology (principles and phases); v) main limitations and the expected products. This was followed by general guidelines on how the participants could review and give their inputs on the map and vegetation units through the WebGIS tool.

After these presentations, the process of jointly reviewing the web map and the respective vegetation descriptions was initiated. Each participant was encouraged to focus on the areas/units they were most familiar with or felt most comfortable with to suggest changes or provide additional data.

Besides informing several key institutions on the stage of the development of the map, this technical workshop, also allowed the collection of feedback and recommendations from the participants, which contributed to the improvement of the final product. All the comments that were made on the map were subsequently incorporated. Although significant progress was made during the workshop, the participants were reluctant to adopt the vegetation map without further discussion to reach consensus, so that it could then be presented to higher levels of government.

Figure 1.14– Workshop with stakeholders to present and review the historical ecosystem draft map held on 22 January 2021, at Radisson Blu Hotel, Maputo

2.4 Additional technical meetings

Throughout the three weeks following the workshop, the experts continued to provide their comments and two additional technical meetings were undertaken (28 January and 8 February). All comments received were incorporated in the map.

Phase 3: Review and fine tuning the proposed classification

The culmination of Phase 2 was the publication of a vegetation map and accompanied document referred to as Version 1.0. This document and map were again reviewed by the Mozambican experts where improvements were suggested, such as including a list of endemic species for each vegetation type. Phase 3 started in July 2021 and entailed the detailed review of the map and of the vegetation descriptions and accompanied text with significant improvements. Two new vegetation units were added, and the authors met with the South African National Biodiversity Institute to standardise the application of the IUCN Typology. Several meetings and presentations were held with the experts that resulted in a detailed review and validation of the vegetation map. These same platforms were used to translate the English names to Portuguese, and to provide a standardised list of Portuguese names for each vegetation type.

3.1 Providing English and Portuguese names

During one of the technical meetings with the national expert advisory committee, it was decided that each vegetation unit, or ecosystem, would have both an English and Portuguese name, and maps would be created to show both. Therefore, once the vegetation map was finalised, the list of Portuguese names was workshopped and finalised for inclusion with the Red List of Ecosystems and vegetation map.

3.2 Improvements on scale

The final vegetation map represents a significant improvement on the number of vegetation types identified (Figure 1.15), compared to 1955 and 1967 maps, as well as the scale of the vegetation map (Table 1.4). It is accurate at an estimated scale of 1: 250 000 and suitable for use in conservation planning and related assessments.

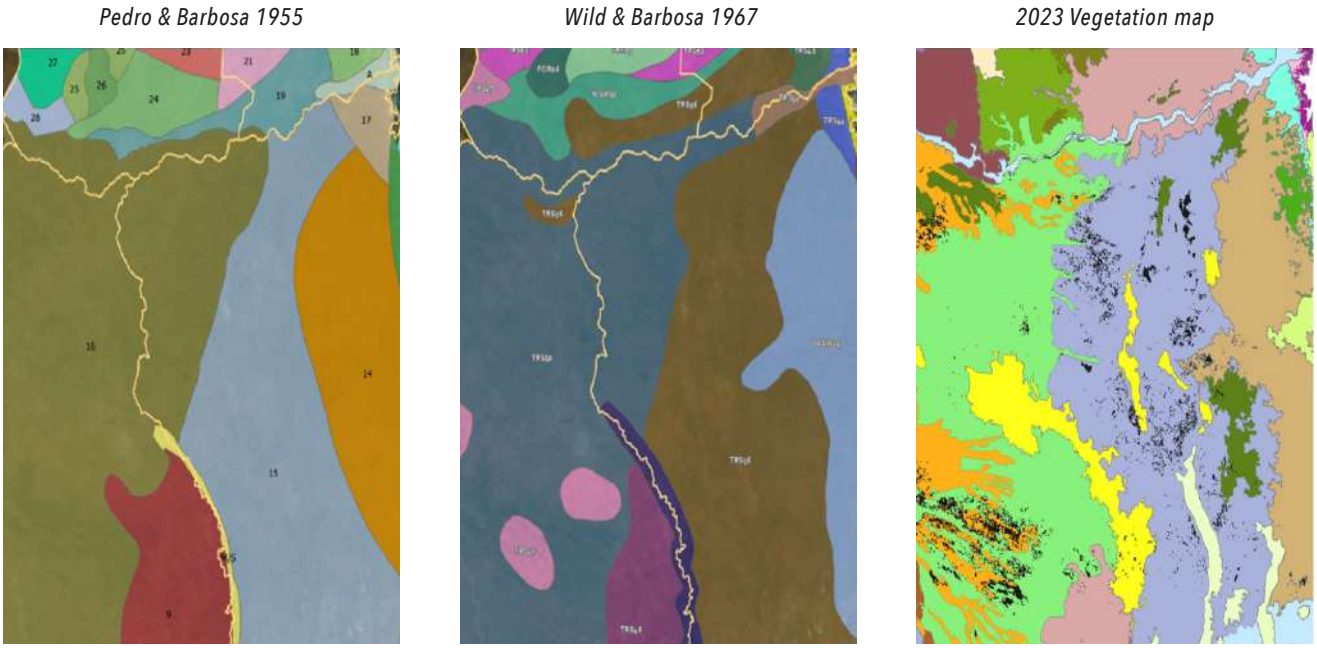


Figure 1.15– Comparison of mapping scale for area just south of the Save River.

Table 1.4 – Summary of improvements in mapping scale and number of vegetation units

	Mozambique vegetation map Version 2021	Wild & Barbosa 1967	Pedro & Barbosa 1955
# of vegetation units	162	52	113
Mapping scale	1: 250,000	1; 2,500,000	1: 2,000,000

3.3 Climate diagrams

We created climate diagrams for each vegetation unit using multiple climate variables derived from modelled climatologies at high resolution for the earth's land surface areas. These diagrams were added to each ecosystem in the summary report to aid interpretation (Figure 1.16). In the supplementary material presented in Appendix 4, we describe all variables used in constructing the climate diagrams and climate and altitude summary data. We used R 4.1.2 statistical platform (R Core Team 2021) and a combination of contributed R packages specified below to source and process the climate data and diagrams.

Limitations

One of the limitations includes the mapping of the azonal units, particularly the wetlands of Mozambique. To map an estimated 100 000+ wetlands (and dambos) would be a massive undertaking and outside the scope of this study. The authors also acknowledge that what is presented here is their hypothesis of the vegetation types of Mozambique. They may not have always got it right, yet what is presented is a massive improvement on anything that was available before and the annual review of the map would allow for its gradual improvement.

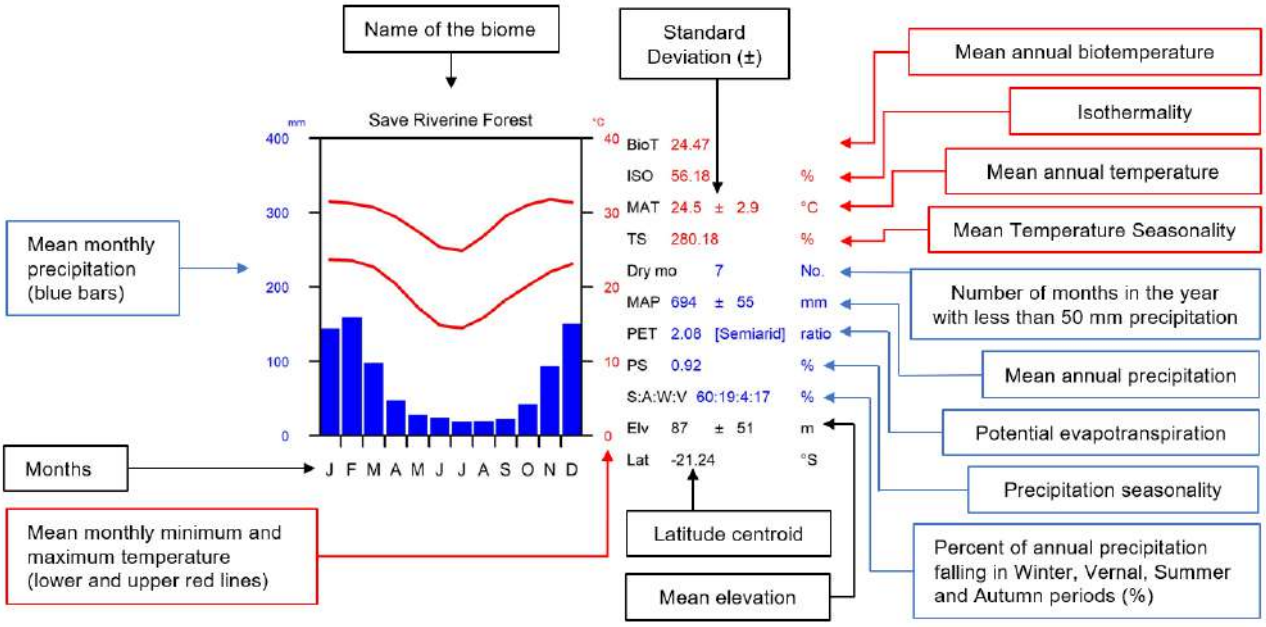


Figure 1.16– Graphical explanation of the variables involved in the construction of a climate diagram.

1.4.4 IUCN Red List of Ecosystems Assessment

For each terrestrial ecosystem in Mozambique, we assessed the Red List of Ecosystems criteria for which appropriate data was available. All ecosystems were assessed against criteria A (reduction in geographic distribution) & B (restricted geographic distribution), and a subset of ecosystems were assessed against criterion D (disruption of biotic processes). We excluded two ecosystems (Freshwater Lakes & Coastal Lagoons) from all analyses, as no useful data was available to assess them, so they were assigned to the "Data Deficient" category for all criteria. However, we included Banhine Inland Salt Pans in the assessment, despite it being classified within the "Lake" biome of the IUCN typology, because our data on land cover showed observable human impacts occurring within this ecosystem. In this section we outline the broad methods used to assess each ecosystem under each criterion.

Criterion A3

Assessments of criterion A require the extent of ecosystem loss to be quantified over the Red List of Ecosystems timeframes (Table 1.1). There is very little existing research on the extent of ecosystem loss in Mozambique, with the most accurate historical ecosystem map being produced in 1967 (Wild and Barbosa, 1967), and few updates since then. As such, detailed studies on specific ecosystem types were generally unavailable. We therefore assessed all newly mapped ecosystems against Criterion A3 (historical change) by using 2016 land cover data (FNDS, 2019)

& 2017-2020 deforestation data (Unidade MRV, 2020) to mask areas of the historical ecosystem map (Figure 1.17A) that have since been converted to human land uses (urban areas, agriculture; deforestation Figure 1.17B). This resulted in a historical (pre-1750) and 2020 ecosystem map (Figure 1.17C), and we used the R package redlistr to assess historical decline (criterion A3) for each ecosystem (Lee et al., 2019).

Criterion A2a

For 16 montane & sub-montane ecosystems, we also assessed criterion A2a, by modelling future ecosystem distributions under climate change scenarios. Because climate models & future emissions scenarios are extremely variable, we restricted this assessment to montane & sub-montane ecosystems due to their high vulnerability to climate change (Table 1.5) Methods for this assessment are described in detail below:

Table 1.5 - Ecosystems assessed for criterion A2a

Ecosystems assessed for criterion A2a
Angonia Gneiss Montane Miombo
Angonia Montane Moist Miombo
Central Lowland Moist Forest
Central Mid-elevation Moist Forest
Central Montane Forest
Central Submontane Forest
Chimanimani Montane Grassland
Chimanimani Montane Miombo
Chitonga Montane Wooded Grassland
Gorongosa Montane Grassland
Lichinga Montane Moist Miombo
Macanga Montane Moist Miombo
Manica Montane Grassland
Namuli Montane Grassland
Northern Inselberg Woodland
Northern Montane Forest
Northern Submontane Forest
Zumbo Montane Miombo

Vegetation data: Using the 2020 ecosystem map, we rasterized the distribution of each assessed ecosystem using a majority rule, at a 30 arc-second resolution to match the climate input data (described below). We assumed that areas of human impact remained unsuitable for all natural vegetation types, both currently and in the future. Because the rasterized ecosystem distributions are coarser than the native resolution of the FNDS land cover data used to map human impacts, we then produced a second raster where each cell represents the percentage of its area that is suitable for natural ecosystems.

Climate data: For climate data, we used CMIP6 global data obtained from CHELSA and clipped to the country boundary extent (Karger et al., 2017). Specifically, we used a subset of the bioclimatic variables, a set of 19 variables based on monthly measures of temperature and precipitation that capture aspects of range and seasonality. These variables are known to have an effect on the spatial distribution of ecosystems and species. We used a six-variable subset of these 19 variables, shown in Table 1.6, that can be thought of as biologically limiting factors.

Table 1.6 - Climate variables used in Criterion A2a assessment

Bioclimatic variable	Description
Bio1	Mean annual temperature
Bio5	Maximum temperature of warmest month
Bio6	Minimum temperature of coolest month
Bio12	Mean annual precipitation
Bio17	Monthly precipitation of driest quarter

The bioclimatic variables are available from CHELSA for the 'present time period' (averaged from 1980-2010), as well as midcentury and endcentury projections for five different global circulation models (GCMs) and three different emissions scenarios, ranging from optimistic to pessimistic. We focused on the midcentury timepoint – for each emissions scenario and bioclimatic variable, we averaged the projections from all five GCMs, giving three sets of variables, each representing a different emissions scenario at the same future timepoint (2041-2070).

Topographical data: In addition to the climate data described above, we incorporated topographical data in the form of the SRTM Landforms dataset (Theobald et al., 2015). The Landforms dataset uses input elevation and derived topographical data (e.g., slope, aspect) to classify the Earth's terrestrial surface into 15 different landforms, (e.g., peak/ridge, cliff and valley) at a 30 meter resolution. We resampled this dataset to match the other inputs using a majority rule. We elected to use landform data, rather than elevation alone, as elevation is generally an indirect predictor of biological processes through its effect on climate parameters, and climate parameters were explicitly included as variables. Moreover, landform

data correlates with ecologically sensitive parameters such as soil. For example, landform data may capture the presence of a narrow riparian valley, which may be suitable for riparian woodlands even as the immediate surroundings are unsuitable for forests – elevation data alone would fail to capture these nuances.

Modelling algorithm: We performed the modelling required to produce climate projections for threatened vegetation types in R. Specifically, we implemented an unsupervised classification random forest algorithm using the randomForest package (Breiman, 2001). For each vegetation type, we created a 100-kilometer buffer, representing the potential area that could be occupied by that vegetation type in the future. From that buffer, we selected a random sample of 1000 points, which where then partitioned 70-30 into training and test data, each of which had to contain at least one point located within the current extent of the focal vegetation type. We then created 500 trees using a random forest algorithm, based on the climate and topographical data described above, and used those trees to create an ensemble prediction for both current and future distribution of the vegetation type based on current and future climate conditions. As described above, we assumed that any area which is currently under human land-uses would not be suitable for future occupation by modelled ecosystems as their distributions shift.

We then used the test dataset to calculate the overall prediction accuracy, as well as the sensitivity and specificity, of the model. We repeated this process for 10 different sets of random points, to account for the error introduced by Monte Carlo sampling. Finally, we averaged the 10 predictions of current and future extents, using the individual prediction accuracy values as weights. While climate modelling was undertaken for 16 ecosystems, we excluded some from the assessment based on the model results. We only considered models to be acceptable if their sensitivity was >0.6, meaning they correctly predict the current ecosystem distribution in more than 60% of the random points used for testing. For the models selected, the area of modelled current distributions was within +- 20% of the actual current distributions.

This process was repeated for all three emissions scenarios (in order of increasing future emissions: ssp126, ssp370 and ssp585), for the time period 2041-2070. To generate overall RLE statuses under this criterion, we took the average predicted future ecosystem extent under all ssp scenarios. Plausible bounds for each assessed ecosystem are reported as the individual statuses for future ecosystem area under ssp126 and ssp585.

Criterion B

We developed a 2020 ecosystem extent map by using 2016 land cover data (FNDS, 2019) & 2017-2020 deforestation data (FNDS, 2020) to mask areas of the historical ecosystem map that have since been converted to human land uses (urban areas, agriculture; Figure 1.17). We assumed that there was no ecosystem recovery after deforestation from 2017-2020, such that areas converted or deforested at any point were considered to remain converted in the 2020 map. We then applied the R package redlistr (Lee et al. 2019) to compute a minimum convex polygon that encompassed the entire distribution of each ecosystem within Mozambique (EOO) to measure criteria B1, and the number of 10 x 10 km grid cells occupied by each ecosystem (AOO) for criteria B2.

Calculating the EOO for criteria B1 and AOO for criteria B2 gives an initial indication of risk, but to be listed as threatened under Criteria B there also needs to be additional evidence of either: a) ongoing decline in extent or degradation (biotic or abiotic); b) observed or inferred threatening processes, or c) location based threats (see IUCN Red List of Ecosystems guidelines for further information). As such, we applied two filters to determine which ecosystems were facing ongoing threats. For ecosystems to qualify as threatened under Criterion B, ecosytems needed to have: 1) experienced a historical decline >= 30%, indicating that they have been substantially impacted by human activities across a large portion of their distribution, and 2) show declines of >=0.4%/yr from 2017-2020, indicating that these declines are ongoing. These thresholds align with the RLE assessment undertaken in South Africa, which will facilitate comparison of national-scale results and development of regional Red List of Ecosystems assessments in the future. We used FNDS 2017-2020 deforestation data to assess the declines from 2017-2020, and restricted these data to only include areas that were mapped as natural classes in the FNDS 2016 land cover map. This was done to exclude the possibility of cropland or plantation harvesting being detected as deforestation of natural ecosystems.

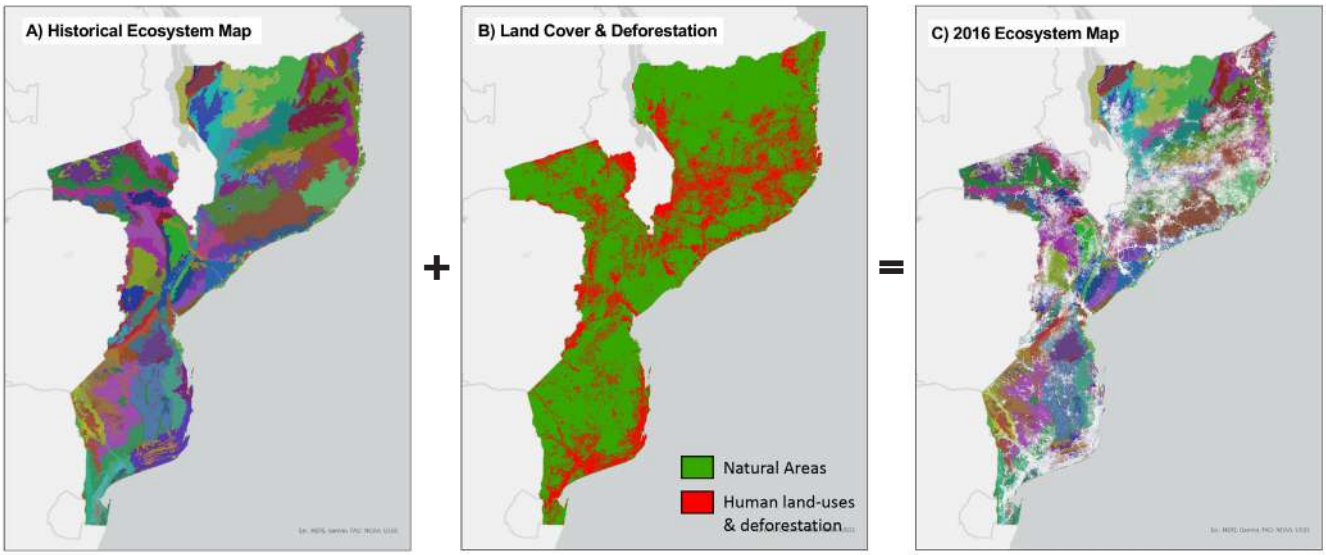


Figure 1.17– A) Historical ecosystem map of Mozambique; B) 2016 land cover map, with agriculture and urban areas categorized as human land-uses, and all other classes categorized as natural; C) 2016 Ecosystem map, created by using 2016 land cover to mask land that has been converted to agriculture or urban areas.

Criterion D

Forest Ecosystems

To assess criterion D for forest ecosystems, we analysed the extent and severity of biotic change using the recently developed Forest Landscape Integrity Index (Grantham et al., 2020). The index integrates maps of changes in forest connectivity with data on human pressures known to result in ecosystem degradation to compute a continuous value of contemporary forest degradation at high resolution. We assumed that the index is relative to a natural (historical) state, and therefore used it to assess criterion D3, for ecosystems that have >= 80% coverage with the FLII data extent (other ecosystems were assessed using human footprint data – see next section).

The index is a single score of 0-10 for each 300-m pixel, with near 0 indicating an ecosystem has been subject to a wide range of severe threatening processes and is considered heavily degraded. The index is not linear and the authors found through investigation of widely distributed case studies that a score of above 9.6 suggests that the ecosystem has not been subject to any threatening processes and is considered intact. In contrast, forest ecosystems with scores below 6 are considered to be approaching a degraded state. We set thresholds for >=90%, >=70% and >=50% relative degradation severity by reviewing maps of the index in Mozambique based on stakeholder feedback and local expert opinion (Table 1.7, Figure 1.18).

Table 1.7– Forest Landscape Integrity Index scores used to categorise degradation severity.

FLII Value	Degradation severity
0-4	>90% (Very High Degradation)
4-6	70-90% (High Degradation)
6-9	50-70% (Medium Degradation)
>9	<50% (Low Degradation)

Because the global FLII dataset is masked to forest areas defined using a global tree canopy cover threshold, some areas of forest and woodland in Mozambique are not covered by FLII data. As such, to assess Criterion D we extracted ecosystems which had >=80% coverage by the FLII data. We then clipped the FLII data to the distribution of each ecosystem, and quantified the proportion of the ecosystem mapped within each degradation severity class (Figure 1.18). Conservatively, we assumed that areas where FLII data was missing were in the lowest degradation class. Finally, we applied the extent & degradation severity matrix displayed in Table 1.1 to assess ecosystem threat status based on Criterion D3.

Non-forest ecosystems

To assess criterion D for non-forest ecosystems, we analysed the extent and severity of biotic change using a dataset of Human Footprint in Mozambique. (Jones et al., 2022). This framework uses data on multiple human pressures on the environment, estimates the

impact of each stressor, and then combines these scores to give a single index between 0 and 50 which estimates total human pressure on the environment (Figure 1.19). We updated a globally available human footprint layer (Venter et al. 2016) using Mozambique-specific data to generate a Mozambique human footprint map. We considered the following human pressures: (1) the extent of built environments; (2) crop land; (3) human population density; (4) night-time lights; (5) railways; (6) roads; and (7) navigable waterways. Table 1.8 outlines the data sources for each pressure.

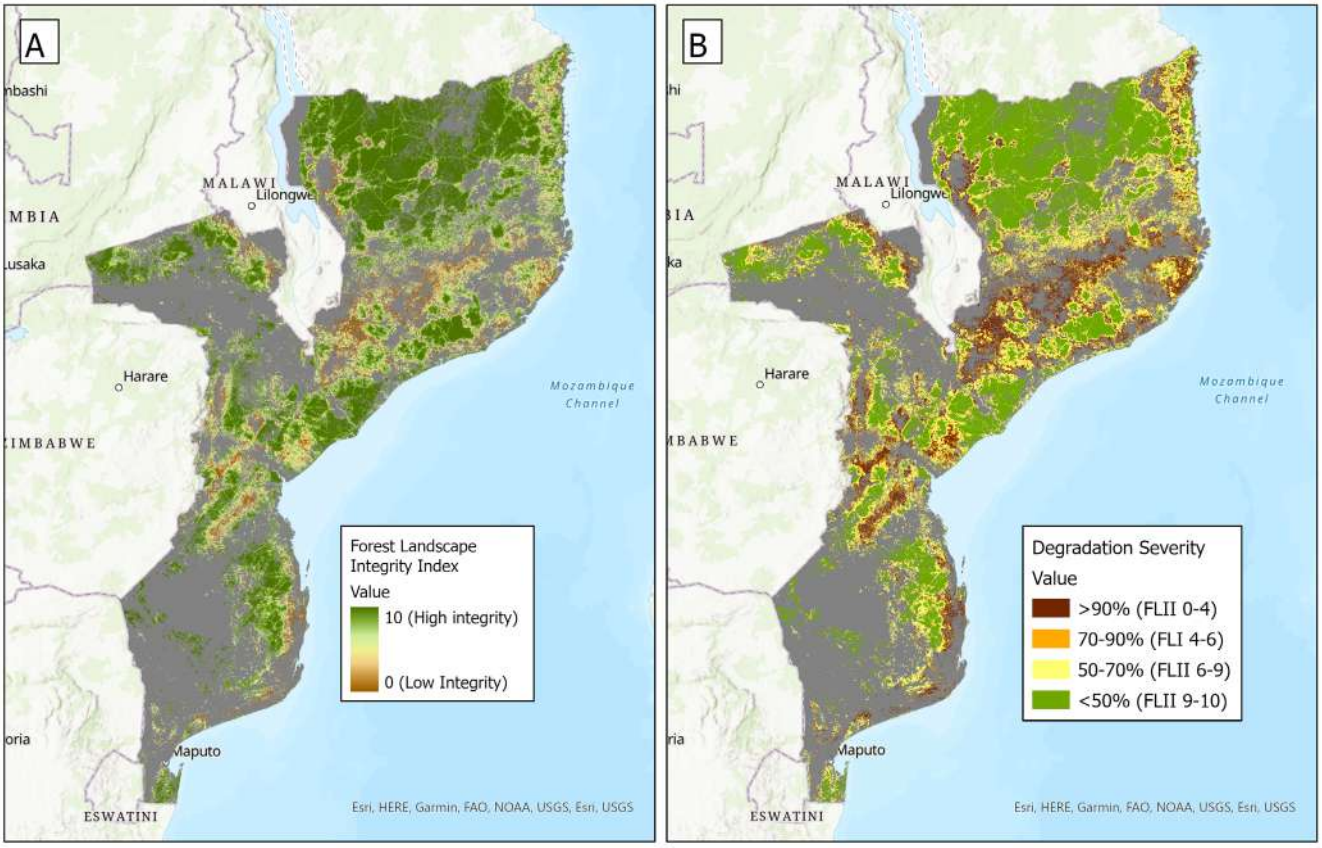


Figure 1.18– A) Forest Landscape Integrity Index (FLII), B) Degradation Severity classes used to assess Criterion D3.

Table 1.8– Data sources for human footprint map development

Human Pressure	Dataset
Built Environments	FNDS 2016 LULC Map
Cropland	FNDS 2016 LULC Map
Human Population Density	Venter et al. (2016)
Night-time Lights	Venter et al. (2016)
Railways	Venter et al. (2016)
Roads	ANR Mozambique
Navigable Waterways	Venter et al. (2016)

The weightings and combination of stressor layers followed the approach outlined in Venter et al. (2016). As with the Forest Landscape Integrity Index assessment, we assumed that the index is relative to a natural (historical) state, and therefore used it to assess criterion D3, for ecosystems that do not have <80% coverage with the Forest Landscape Integrity Index. A small number of coastal systems had poor coverage from both the Human Footprint and Forest Landscape Integrity Index and were excluded from assessment under criterion D. We set thresholds for >=90%, >=70% and >=50% relative degradation severity by reviewing maps of the Human Footprint in Mozambique based on stakeholder feedback and local expert opinion (Table 1.9).

Table 1.9 – Human Footprint scores used to categorise degradation severity.

Human Footprint Value	Degradation severity
20-50	>90% (Very High Degradation)
11.5-20	70-90% (High Degradation)
3-11.5	50-70% (Medium Degradation)
0-3	<50% (Low Degradation)

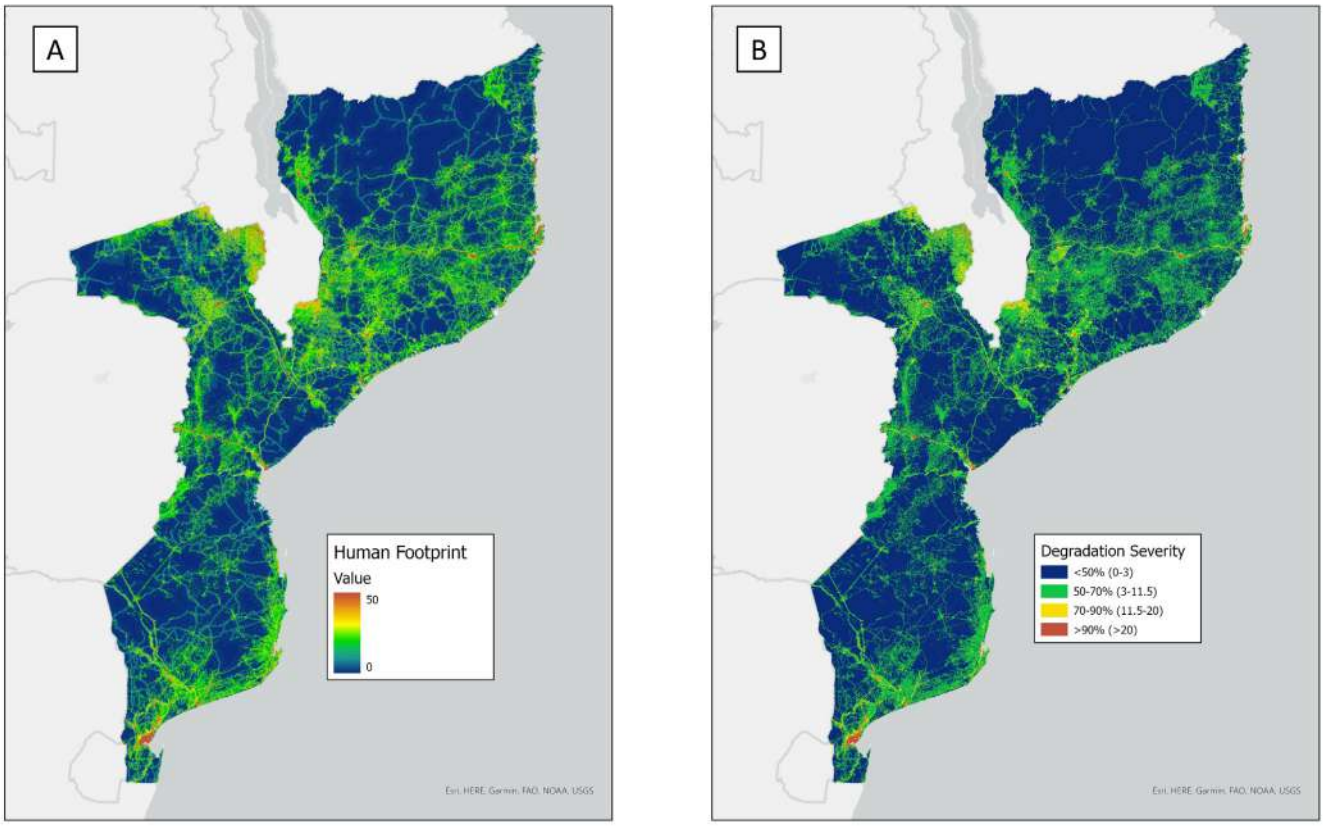


Figure 1.19– A) Human Footprint Index, B) Degradation Severity classes used to assess Criterion D3.

Criterion D Sensitivity Analyses

To assess the sensitivity of our criterion D results to the choice of thresholds used to define degradation severity classes, we conducted a sensitivity analysis by raising and lowering the thresholds and examining the resulting criterion D threat classifications by ecosystem. Table 1.10 outlines the various thresholds used in the sensitivity analysis for the Forest Landscape Integrity Index and the Human Footprint.

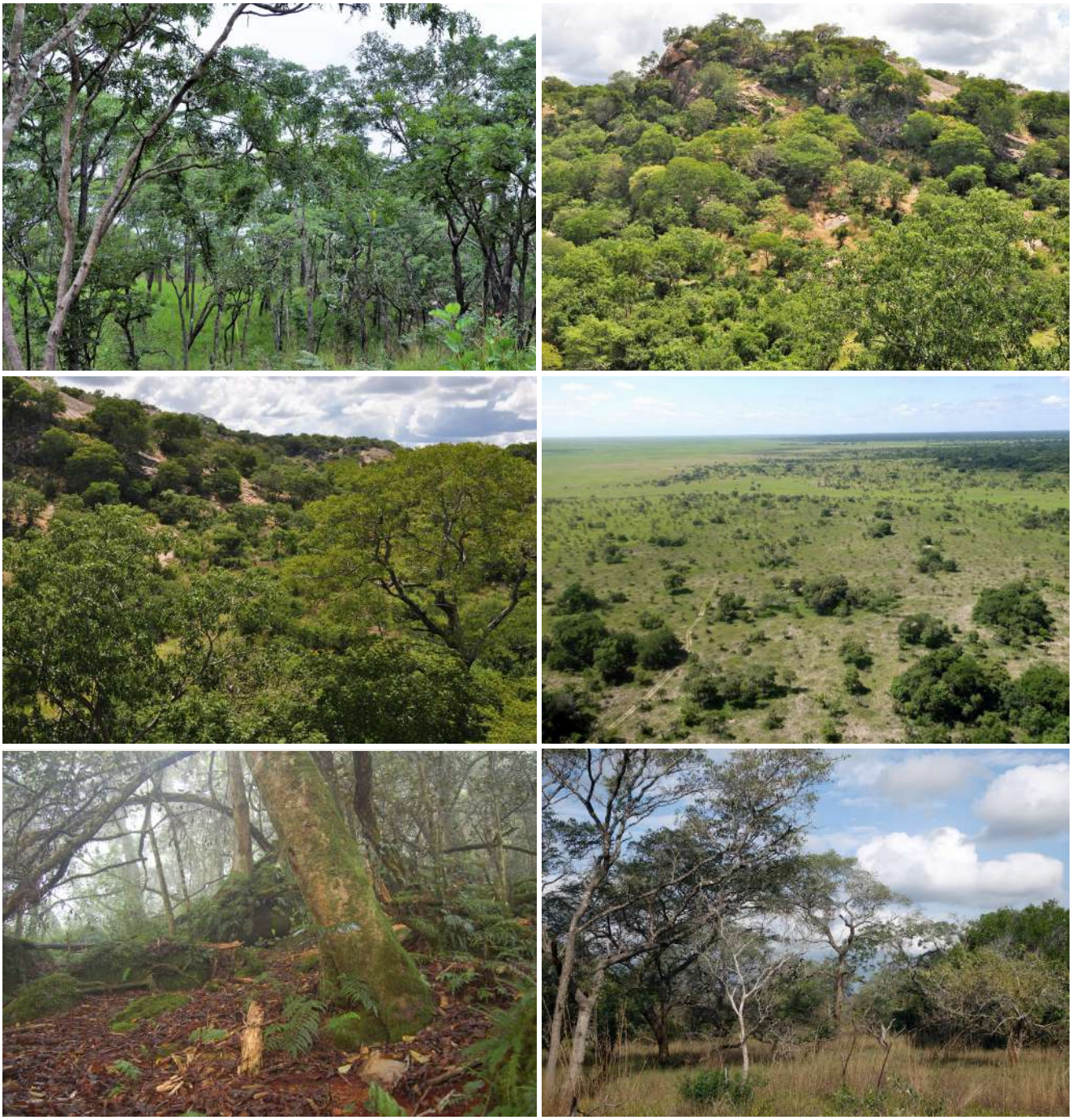
Overall, the results of the sensitivity analysis showed very low sensitivity when using the human footprint, and higher sensitivity under the Forest Landscape Integrity Index assessment. The three different human footprint analyses vary by changing two ecosystems from least concern to vulnerable in the "high" scenario, and no changes in the low scenario (Table 1.10). When using the FLII, the high scenario resulted in a small increase in endangered ecosystems (3) & addition of one critically endangered ecosystem (Table 1.11), while the low scenario resulted in most vulnerable ecosystems shifting into the Least Concern category. In order to balance inclusion of potentially degraded ecosystems against over-estimation of degradation & subsequent threat statuses, the "standard" thresholds were deemed most suitable for application of the RLE. These thresholds result in vast majority of ecosystems that qualify under criterion D occurring in the Vulnerable category (Table 1.11). These thresholds were reviewed and determined by the expert working group who considered the "standard" thresholds to best represent overall degradation levels across Mozambique.

Table 1.10– Degradation thresholds used in sensitivity analysis

	Forest Landscape Integrity Index			Human Footprint		
	High scenario	Standard scenario	Low scenario	High scenario	Standard scenario	Low scenario
>90% (Very High Degradation)	0-5	0-4	0-3	18-50	20-50	22-50
70-90% (High Degradation)	5-7	4-6	3-5	9.5 - 18	11.5-20	13.5-22
50-70% (Medium Degradation)	7-10	6-9	5-8	1-9.5	3-11.5	5-13.5
<50% (Low Degradation)	10	>9	>8	0-1	0-3	0-5

Table 1.11– Results of Criterion D assessment under sensitivity analysis thresholds

	Forest Landscape Integrity Index			Human Footprint		
	High scenario	Standard scenario	Low scenario	High scenario	Standard scenario	Low scenario
CR	1	0	0	0	0	0
EN	4	1	1	0	0	0
VU	46	50	6	5	3	3
LC	15	15	59	91	93	93



Top to bottom left to right:
Macanga montane moist miombo, Lupata plateau dry woodland, Guro dry woodland, Zambezia delta floodplain grassland, Central montane forest, Tembe sandy bushveld

2. TERRESTRIAL ECOSYSTEMS OF MOZAMBIQUE

The Mozambique ecosystem typology includes 162 ecosystem types across 8 biomes (Table 2.1). The ecosystem typology is consistent with the IUCN global ecosystem typology (Keith et al., 2020) to support crosswalks and comparisons with Red Lists of ecosystems in other countries and regions. The application of the IUCN global ecosystem typology has now been aligned with that of neighbouring South Africa through a collaborative workshop that aligned all shared vegetation units.

The Mozambique ecosystem typology has a hierarchical structure, where each ecosystem type is assigned to a realm, biome and functional group (ecotype), Regional Ecosystem and finally an ecosystem. The ecosystems are based on vegetation units (developed as part of this project). The first three levels (realm/biome/functional group) are directly based on the IUCN typology while IUCN provides guidelines for the latter two.

A Realm refers to one of the four component media in the biosphere (Figure 2.1), biome is the segment of the biosphere united by major functional traits and macro-environmental features (Figure 2.2), and functional group is a group of related ecosystems within a biome (Figure 2.3). Regional Ecosystems are equivalent to the IUCN's biogeographic ecotypes as they are proxies for compositionally distinctive geographic variants that occupy different areas within the distribution of a functional group (Figure 2.4). Finally, the ecosystems are areas that share similar ecological processes, but exhibit substantial difference in biotic composition. They are derived from the bottom-up, directly from ground observations (Figure 2.5).

The distribution of Mozambique's ecosystem types is shown in Figure 2.5, and map data is made publicly available. Figure 2.6 shows a heat map of the distribution of the natural ecosystem types of Mozambique, mapped as the number of ecosystems (level 5) intersecting a 20 x 20 km grid. The number of endemic and near-endemic plant species per ecosystem is presented in Figure 2.7, while in Figure 2.8 presents the number of threatened and Data Deficient plant species per ecosystem. A detailed breakdown of these species, in each ecosystem, is provided in the following section that describes each unit.

Table 2.1 – List of the terrestrial ecosystems of Mozambique developed in this project.

Realm/Biome/Functional Group/Regional Ecosystem/Ecosystem (Vegetation Unit)	Code
REALM: TERRESTRIAL	
T1 Tropical-subtropical forests	
T1.1 Tropical-subtropical lowland rainforests	
African Subtropical Coastal Forest	
Amatonga Lowland Semideciduous Forest	STF6
Bilene Coastal Forest	STF2
Central Lowland Moist Forest	STF4
Central Mid-elevation Moist Forest	STF8
Cheringoma Limestone Gorge Forest	STF3
Maputaland Coastal Forest	STF1
Northern Lowland Moist Forest	STF5
Northern Mid-elevation Moist Forest	STF9
Zambezi Delta Lowland Forest	STF7
T1.2 Tropical-subtropical dry forests and thickets	
African Subtropical Coastal Forest	
Lebombo-KwaZulu Natal Scarp Forest	STF10
East African Dry Coastal Forest	
Icuria Coastal Forest	TDFE1
Macomia Lowland Deciduous Forest	TDFE3
Memba Dry Deciduous Lowland Forest	TDFE4
Mueda Midslope Deciduous Forest	TDFE5

Realm/Biome/Functional Group/Regional Ecosystem/Ecosystem (Vegetation Unit)	Code
REALM: TERRESTRIAL	
Mueda Plateau Moist Forest	TDFE6
Nampula Ironwood Forest	TDFE2
Nangade Deciduous Newtonia Forest	TDFE7
Northern Inselberg Forest	TDFE8
Rovuma Basin Coastal Forest	TDFE9
Southern African Dry Forest	
Inhamitanga Sand Forest	TDFS1
Ironwood Dry Forest	TDFS2
Madanda Sand Forest	TDFS3
Maputaland Sand Forest	TDFS4
Save Sand Forest	TDFS5
Zambezi Valley Sand Forest	TDFS6
Southern African Dry Thicket	
Licuati Sand Thicket	TDT1
Madanda Rubber Sand Thicket	TDT2
Makonde Bamboo Thicket	TDT3
Mazoe Gneiss Dry Thicket	TDT4
Mueda Dry Sand Thicket	TDT5
Nwambiya Sand Thicket	TDT6
Pande Sand Thicket	TDT7
Save Valley Chalk Thicket	TDT8
Zambezian Sand Thicket	TDT9
Subtropical Riparian Forest	
Limpopo-Olifants Riverine Forest	ARF1
Maputo Riverine Forest	ARF2
Save Riverine Forest	ARF3
Tropical Riparian Forest	
Lurio Riverine Forest	ARF5
Rovuma Riverine Forest	ARF4
Zambezi Riverine Forest	ARF6
T1.3 Tropical-subtropical montane rainforests	
Manica-Mulanje Mistbelt Forest	
Central Montane Forest	ATF1
Central Submontane Forest	ATF2
Northern Montane Forest	ATF3
Northern Submontane Forest	ATF4
T3 Shrublands & shrubby woodlands	
T3.1 Seasonally dry tropical shrublands	
Zambezian Inselberg Woodland	
Northern Inselberg Woodland	SVin1
Southern Inselberg Woodland	SVin2
T4 Savannas and grasslands	
T4.1 Trophic savannas	
Lowveld Savanna	
Lebombo Summit Sourveld	SVsl2
Limpopo Lowland Woodland	SVsl5
Northern Lebombo Bushveld	SVsl3
Southern Lebombo Bushveld	SVsl4
Urronga Lowland Dry Woodland	SVsl8
Western Maputaland Clay Bushveld	SVsl9
Mopane Woodland	
Limpopo Ridge Mopane Woodland	SVmwl1

Realm/Biome/Functional Group/Regional Ecosystem/Ecosystem (Vegetation Unit)	Code
REALM: TERRESTRIAL	
Luia Basalt Mopane Woodland	SVmwz1
Mágoè Sandstone Mopane Woodland	SVmwz2
Southern Mopane Woodland	SVmwl2
Zambezi Valley Mopane Woodland	SVmwz3
Subtropical Alluvial Savanna	
Maputo Alluvial Vegetation	ASVs1
Save Alluvial Vegetation	ASVs2
Swahilian Savanna	
Northern Coastal Dry Woodland	SVss2
Tropical Alluvial Savanna	
Buzi-Pungwe Alluvial Vegetation	ASVt1
Rift Valley Floodplain Wooded Grassland	ASVt2
Rovuma Alluvial Vegetation	ASVt3
Zambezi Alluvial Vegetation	ASVt4
Zambezi Delta Floodplain Grassland	ASVt5
Zambezian Savanna	
Bangomatete Rhyolite Dry Woodland	SVsz1
Canxixe Lowland Dry Woodland	SVsz2
Dombe Basalt Dry Woodland	SVsz3
Monapo Klippe Dry Woodland	SVsz8
Rift Valley Lowland Woodland	SVsz9
Save Lowland Dry Woodland	SVsz10
Songo Granite Dry Woodland	SVsz11
Stormberg Dry Woodland	SVsz12
Tete Gabbro Dry Woodland	SVsz13
T4.2 Pyric tussock savannas	
Eastern Coastal Woodland	
Cheringoma Coastal Palm Savanna	SVct1
Inharrime Coastal Palm Savanna	SVct2
Maputaland Coastal Wooded Grassland	SVcs1
Nampula Coastal Palm Savanna	SVct3
Rovuma Coastal Wooded Grassland	SVct4
Save Coastal Palm Savanna	SVct5
Lowveld Savanna	
Gaza Sandy Guibourtia Woodland	SVsl1
Nwambiya-Pumbe Sandy Bushveld	SVsl6
Tembe Sandy Bushveld	SVsl7
Swahilian Savanna	
Mecufi Sandstone Dry Woodland	SVss1
Zambezian Dry Miombo	
Angonia Gneiss Montane Miombo	SVmd1
Barue Escarpment Miombo	SVmd2
Inhambane Coastal Miombo	SVmd3
Lugenda Lowland Dry Miombo	SVmd4
Lurio Valley Dry Miombo	SVmd5
Maravia Plateau Miombo	SVmd6
Memba Dry Miombo	SVmd7
Mueda Mixed Dry Miombo	SVmd8
Pangue Dry Miombo	SVmd9
Save Coastal Miombo	SVmd10
Tete Mixed Dry Miombo	SVmd11
Vilanculos Coastal Miombo	SVmd12

Realm/Biome/Functional Group/Regional Ecosystem/Ecosystem (Vegetation Unit)	Code
REALM: TERRESTRIAL	
Zambezian Savanna	
Guro Dry Woodland	SVsz4
Lupata Plateau Dry Woodland	SVsz5
Madanda Sandstone Dry Woodland	SVsz6
Maringue Sandstone Dry Woodland	SVsz7
Zambezian Wet Miombo	
Amaramba Moist Miombo	SVmw1
Angonia Escarpment Miombo	SVmw2
Angonia Montane Moist Miombo	SVmw3
Barue Plateau Moist Miombo	SVmw4
Cheringoma Coastal Moist Miombo	SVmw5
Cheringoma Escarpment Moist Miombo	SVmw6
Cheringoma Plateau Moist Miombo	SVmw7
Chimanimani Montane Miombo	SVmw8
Chimoio Moist Miombo	SVmw9
Choa Escarpment Moist Miombo	SVmw10
Coastal Berlinia Miombo	SVmw11
Dombe Escarpment Miombo	SVmw12
Gorongosa Escarpment Moist Miombo	SVmw13
Gorongosa Foothills Moist Miombo	SVmw14
Gurue Plateau Moist Miombo	SVmw15
Lake Niassa Lowland Miombo	SVmw16
Lichinga Escarpment Moist Miombo	SVmw17
Lichinga Montane Moist Miombo	SVmw18
Lupilichi Escarpment Miombo	SVmw19
Mabu Moist Miombo	SVmw20
Macanga Montane Moist Miombo	SVmw21
Malema Granite Escarpment Miombo	SVmw22
Manda Moist Miombo	SVmw23
Marrupa Plateau Moist Miombo	SVmw24
Matondonvela Moist Miombo	SVmw25
Mocuba Moist Miombo	SVmw26
Montepuez Plateau Moist Miombo	SVmw27
Morrumbala Lowland Moist Miombo	SVmw28
Morrumbala Plateau Moist Miombo	SVmw29
Mossurize Escarpment Miombo	SVmw30
Mueda Escarpment Miombo	SVmw31
Nametil Moist Miombo	SVmw32
Nampula Granite Escarpment Miombo	SVmw33
Nungo Moist Miombo	SVmw34
Pebane Sandy Shrub Miombo	SVmw35
Ribaue Granite Escarpment Miombo	SVmw36
Rovuma Coastal Moist Miombo	SVmw37
Zumbo Montane Miombo	SVmw38
T4.5 Temperate subhumid grasslands	
Eastern Highlands Grassland	
Chimanimani Montane Grassland	Ge1
Gorongosa Montane Grassland	Ge2
Manica Montane Grassland	Ge3
Northern Highlands Grassland	
Chitonga Montane Wooded Grassland	Gn1
Lichinga Wooded Grassland	Gn2

Realm/Biome/Functional Group/Regional Ecosystem/Ecosystem (Vegetation Unit)	Code
REALM: TERRESTRIAL	
Mecula Summit Grassland	Gn3
Namuli Montane Grassland	Gn4
Ulongue Plateau Grassland	Gn5
REALM: FRESHWATER – TERRESTRIAL	
TF1 Palustrine wetlands	
TF1.1 Tropical flooded forests and peat forests	
Swamp Forest	
Subtropical Swamp Forest	ASwF1
Tropical Swamp Forest	ASwF2
TF1.4 Seasonal floodplain marshes	
Tropical Wetland Vegetation	
Zambezian Papyrus Wetland	AzW4
REALM: MARINE – TERRESTRIAL	
MT2 Supralittoral coastal systems	
MT2.1 Coastal shrublands and grasslands	
African Coral Rag Thicket	
Rovuma Coral Rag Thicket	ACF5
Seashore Vegetation	
Subtropical Seashore Vegetation	AzC1
Tropical Seashore Vegetation	AzC2
Subtropical Dune Forest	
Maputaland Dune Forest	ACF1
Tropical Dune Forest	
Inhambane Dune Thicket	ACF2
Rovuma Dune Thicket	ACF4
Zambezi Chenier Dune Thicket	ACF3
REALM: FRESHWATER	
F2 Lakes	
F2.2 Small permanent freshwater lakes	
Freshwater Lakes	
Freshwater Lake	FWL1
F2.7 Ephemeral salt lakes	
Savanna-Highveld Salt Pan Halophytics	
Banhine Inland Salt Pans	AzS1
REALM: FRESHWATER – MARINE	
F2 Lakes	
FM1 Semi-confined transitional waters	
FM1.3 Intermittently closed and open lakes and lagoons	
Coastal Lagoons	
Coastal Lagoons	AzL1
REALM: MARINE - FRESHWATER – TERRESTRIAL	
MFT1 Brackish tidal systems	
MFT1.2 Intertidal forests and shrublands	
Tropical Indian Ocean Mangrove	
Tropical Indian Ocean African Mangrove	AMAN1
MFT1.3 Coastal saltmarshes and reedbeds	
Subtropical Zone Estuary	
Subtropical Coastal Salt Marshes	AzE1
Tropical Zone Estuary	
Tropical Coastal Salt Marshes	AzE3

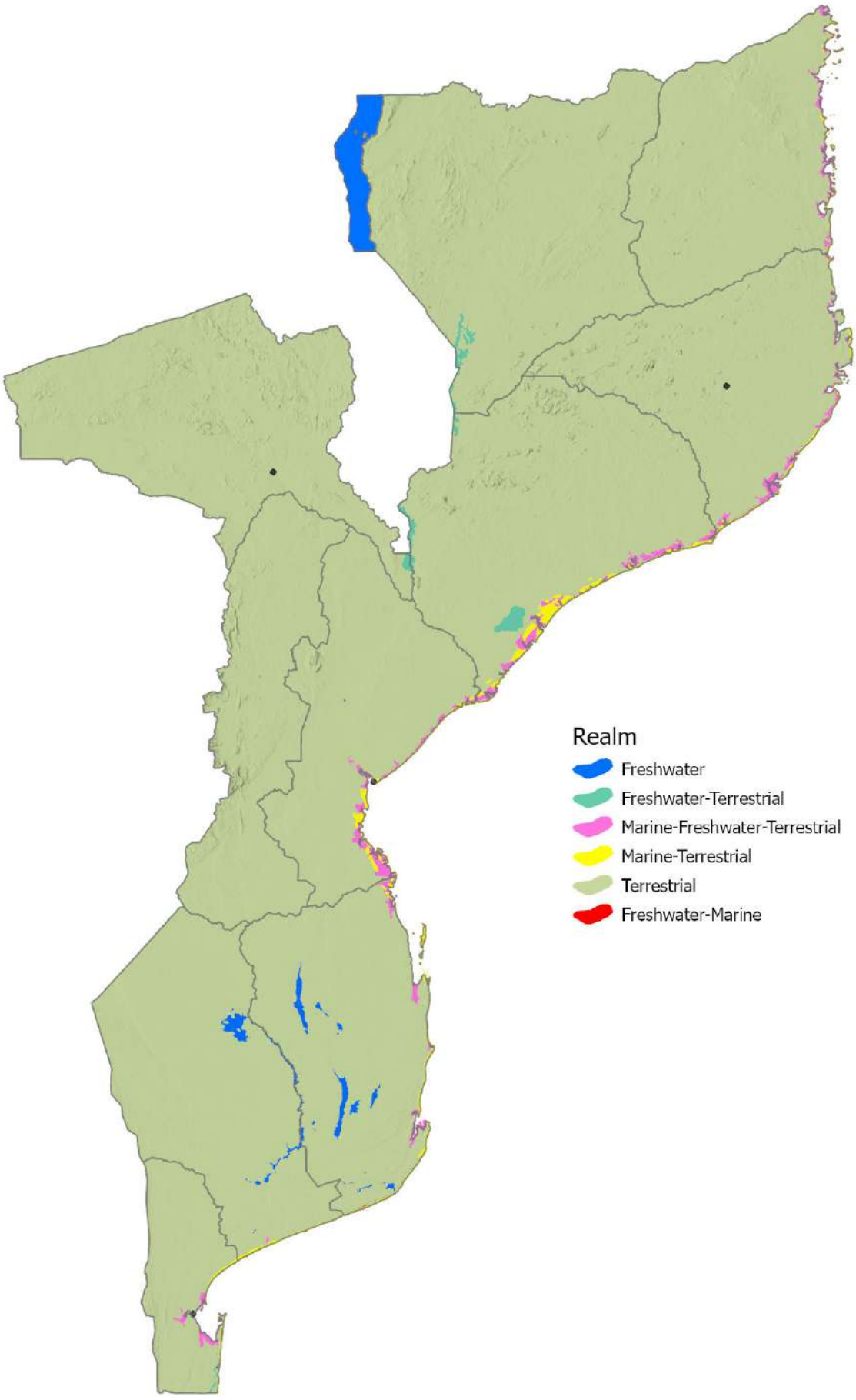


Figure 2.1 –The distribution of the realms of Mozambique (Level 1).

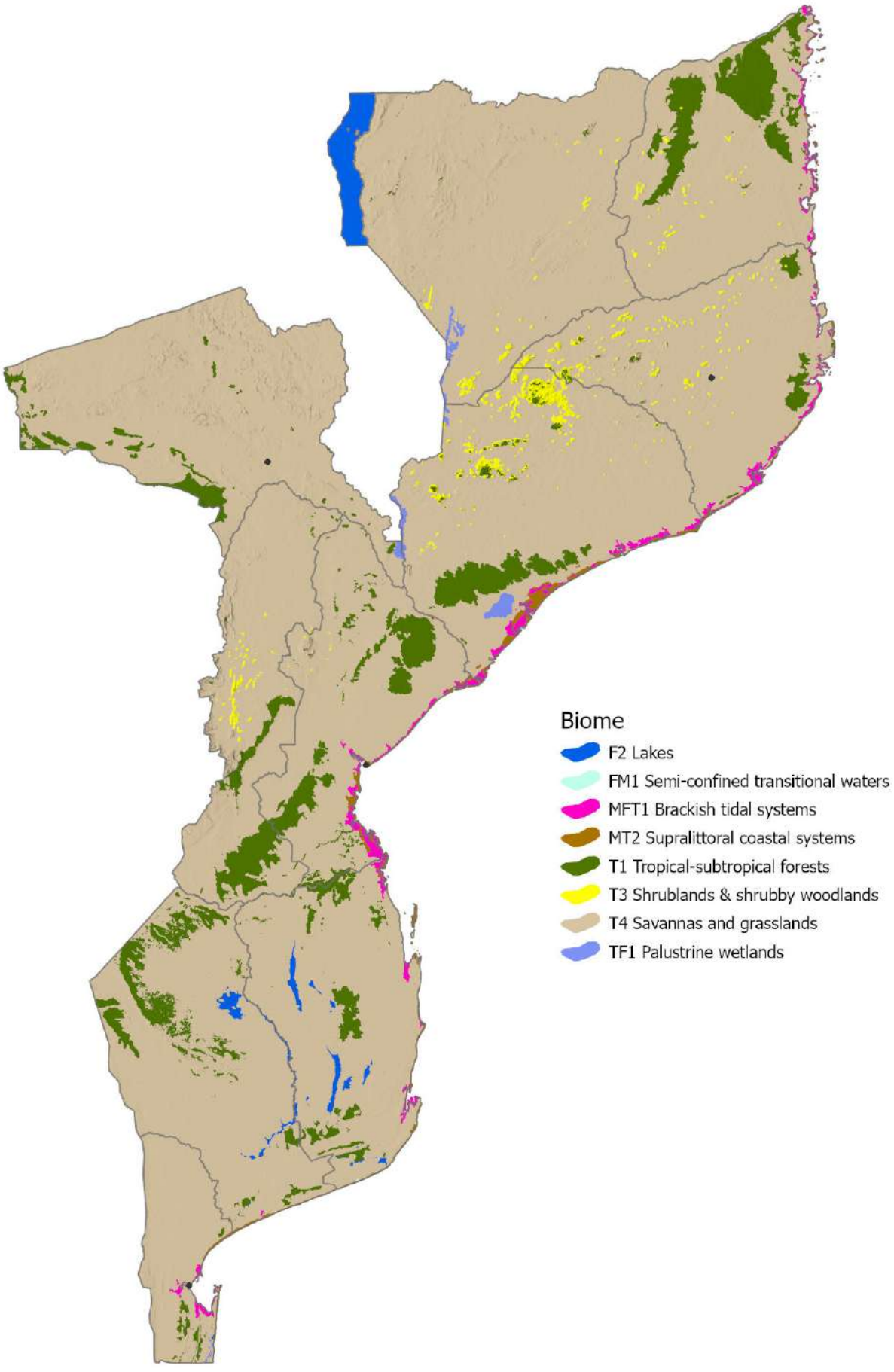


Figure 2.2 – The distribution of the biomes of Mozambique (Level 2).

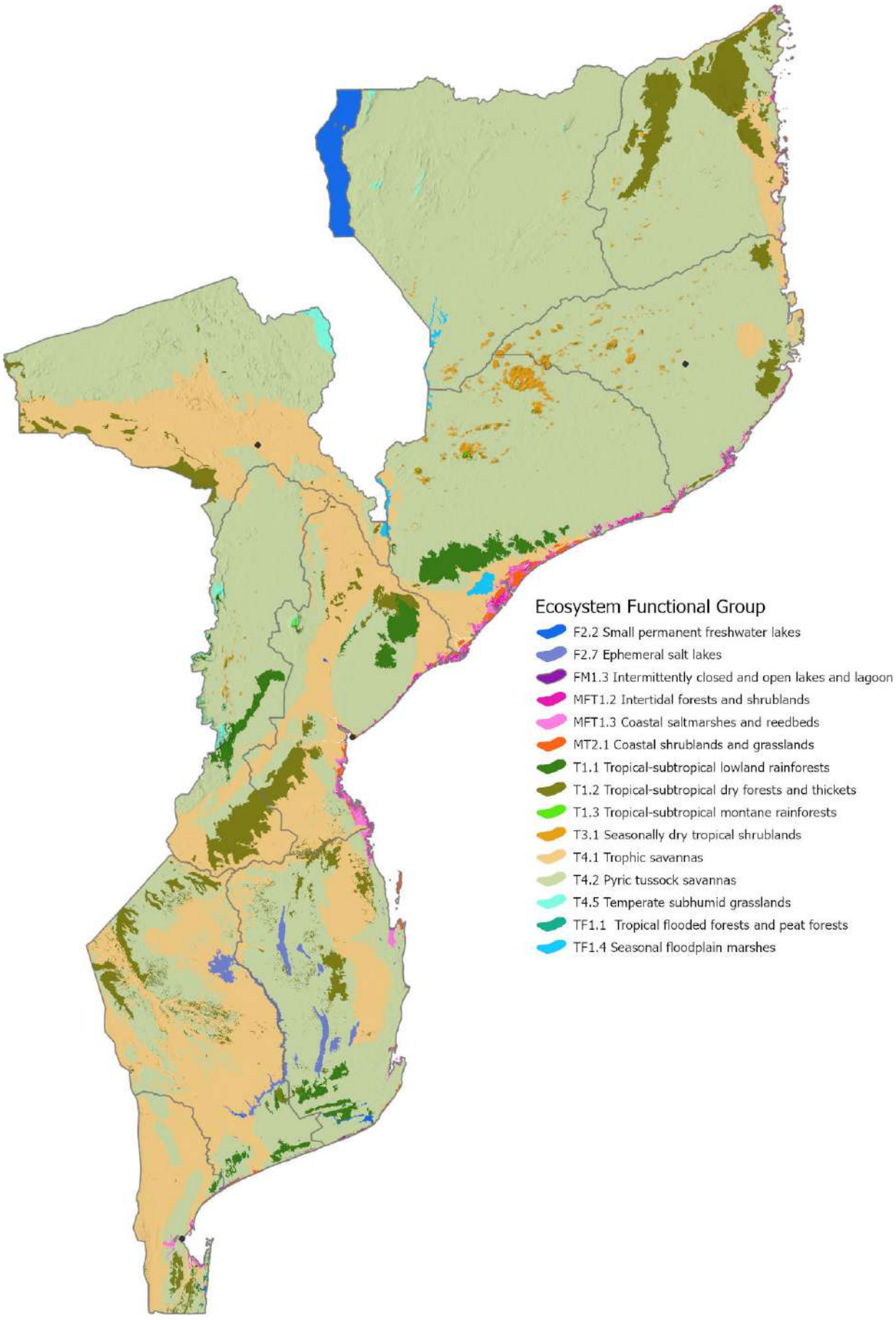


Figure 2.3 – The distribution of ecosystem functional groups of Mozambique (Level 3).

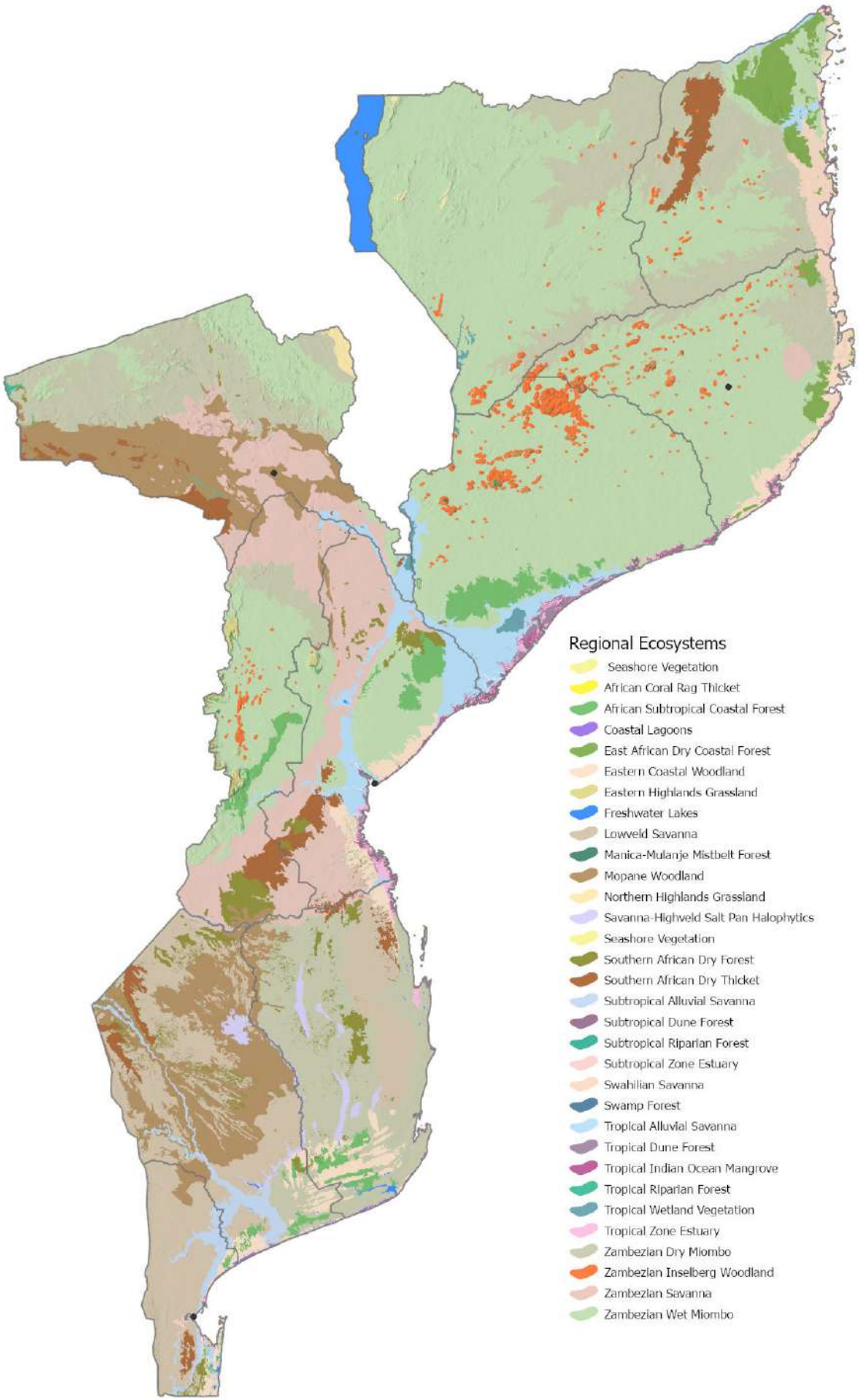


Figure 2.4 –The distribution of regional ecosystems of Mozambique (Level 4).

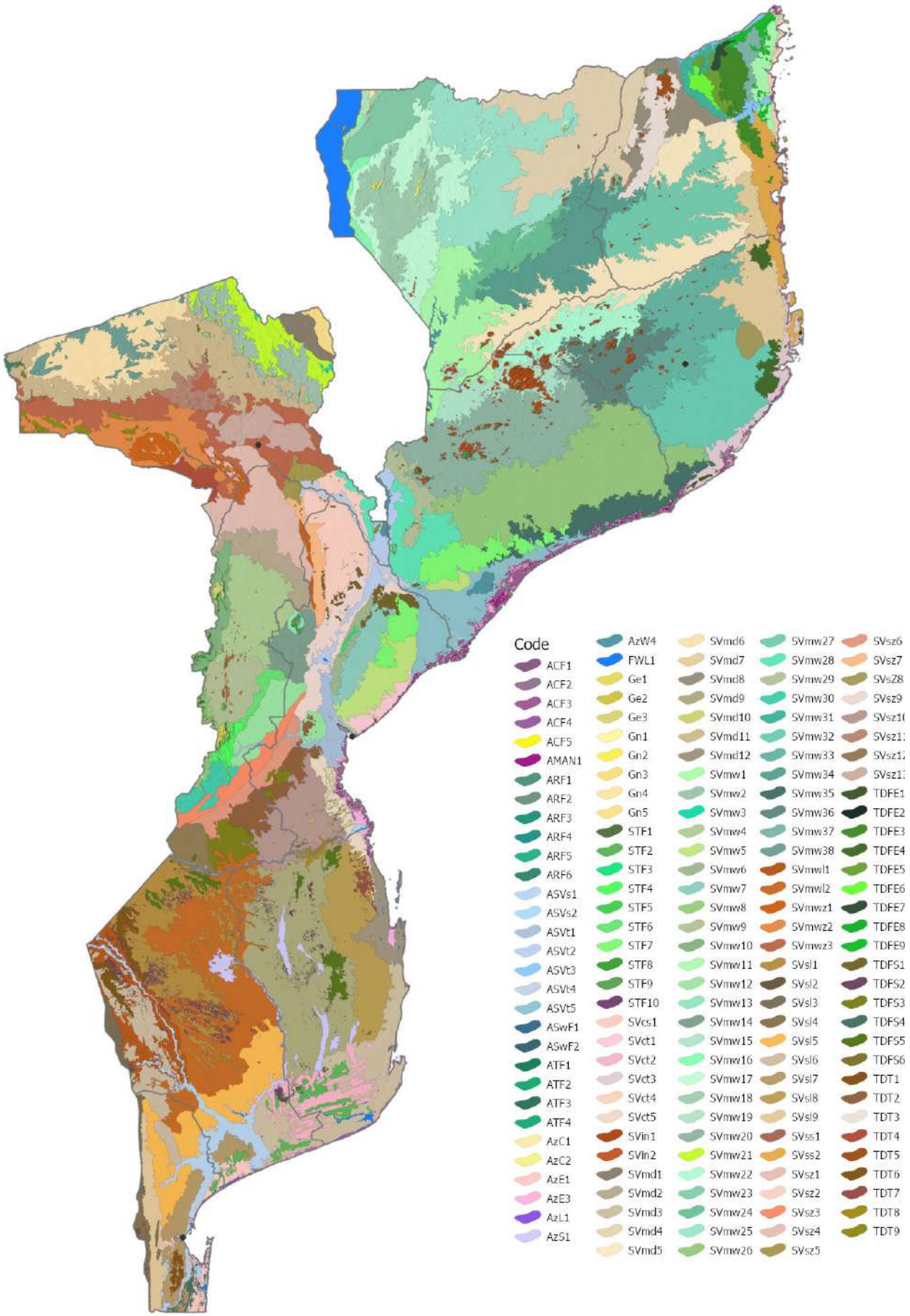


Figure 2.5 – The distribution of terrestrial ecosystems / vegetation units (Level 5).

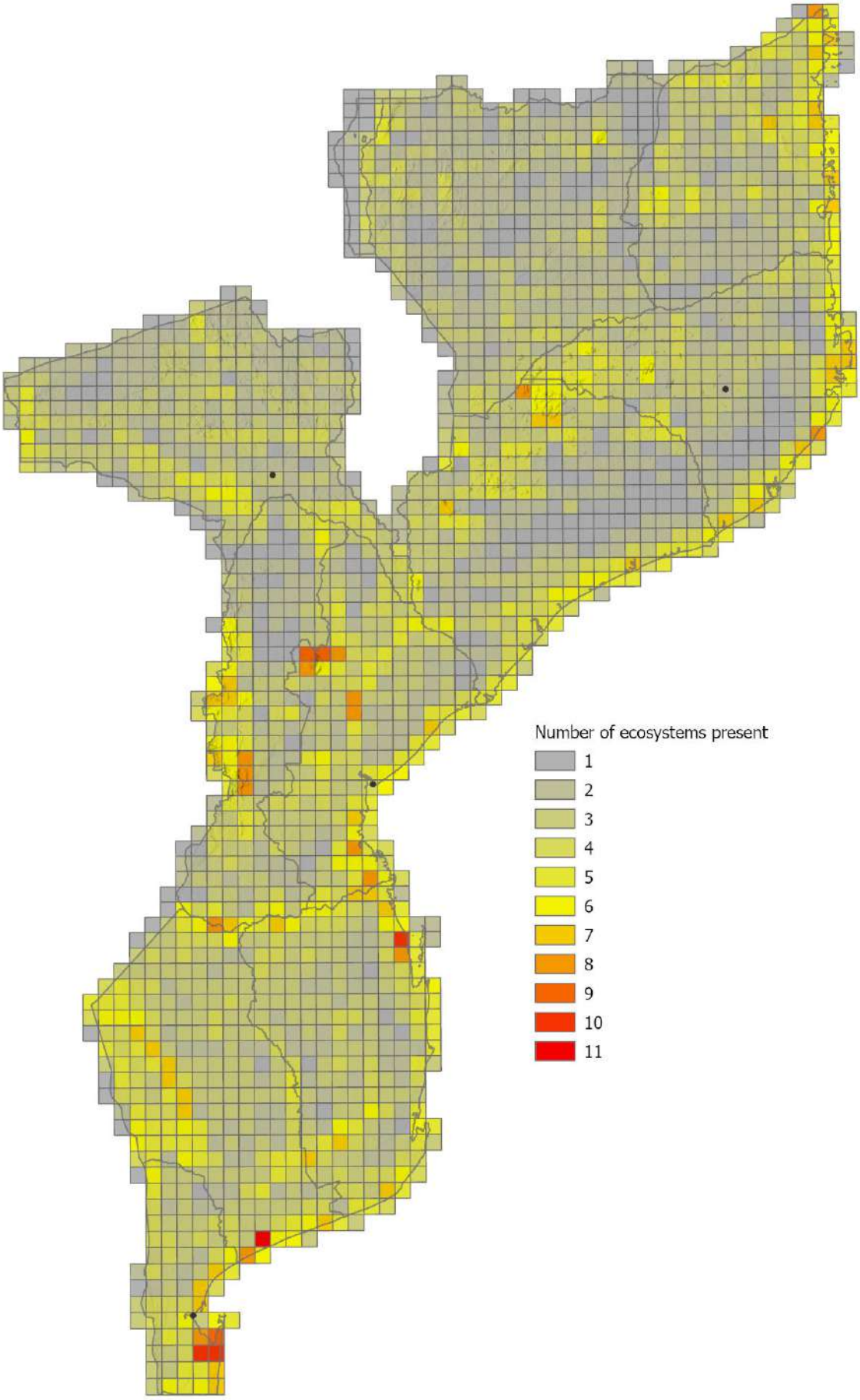


Figure 2.6 – Heat map of the distribution of the natural ecosystem types of Mozambique, mapped as the number of ecosystems (Level 5) intersecting a 20 x 20 km grid.

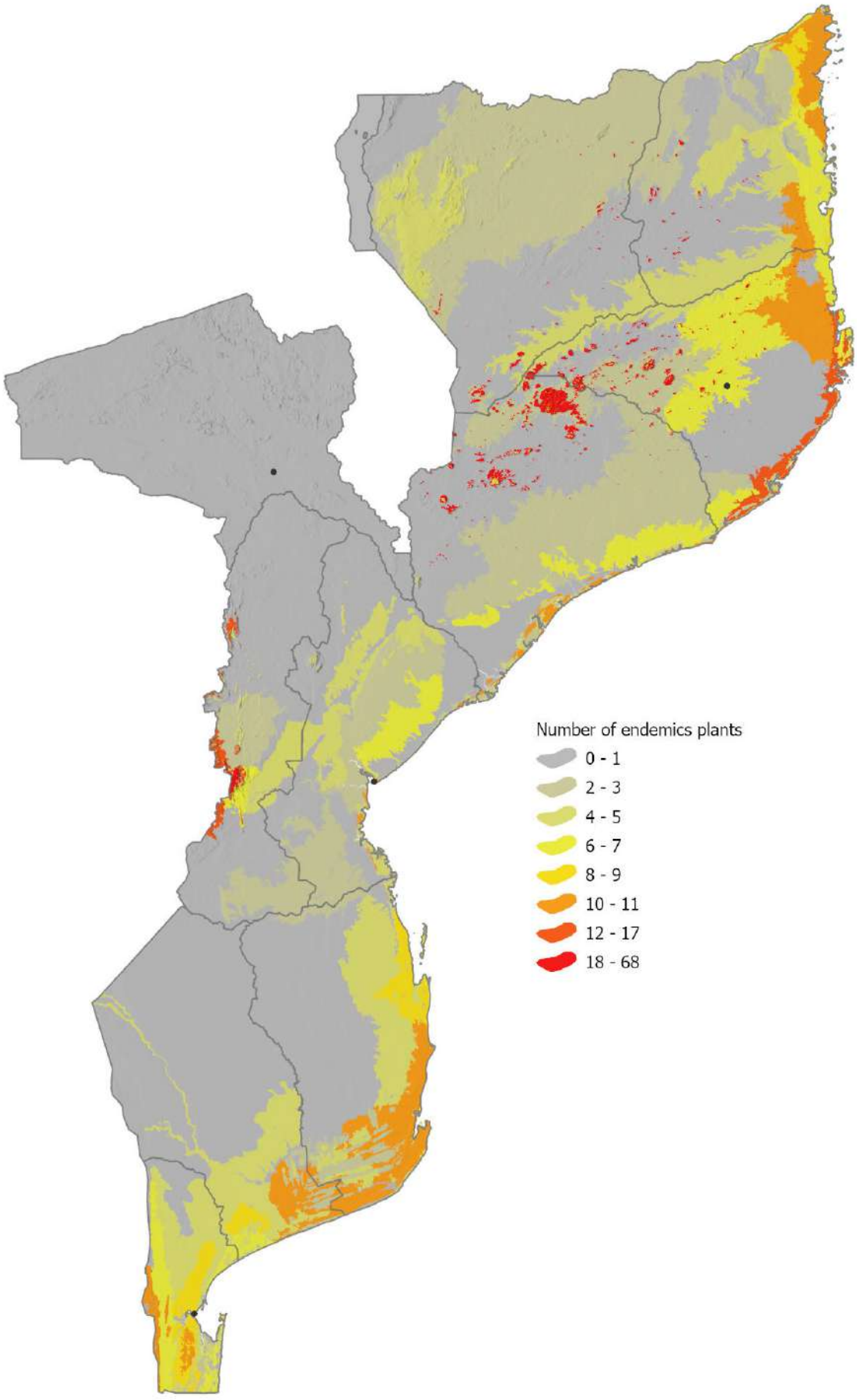


Figure 2.7 – The number of endemic and near-endemic plant species per ecosystem/vegetation unit.

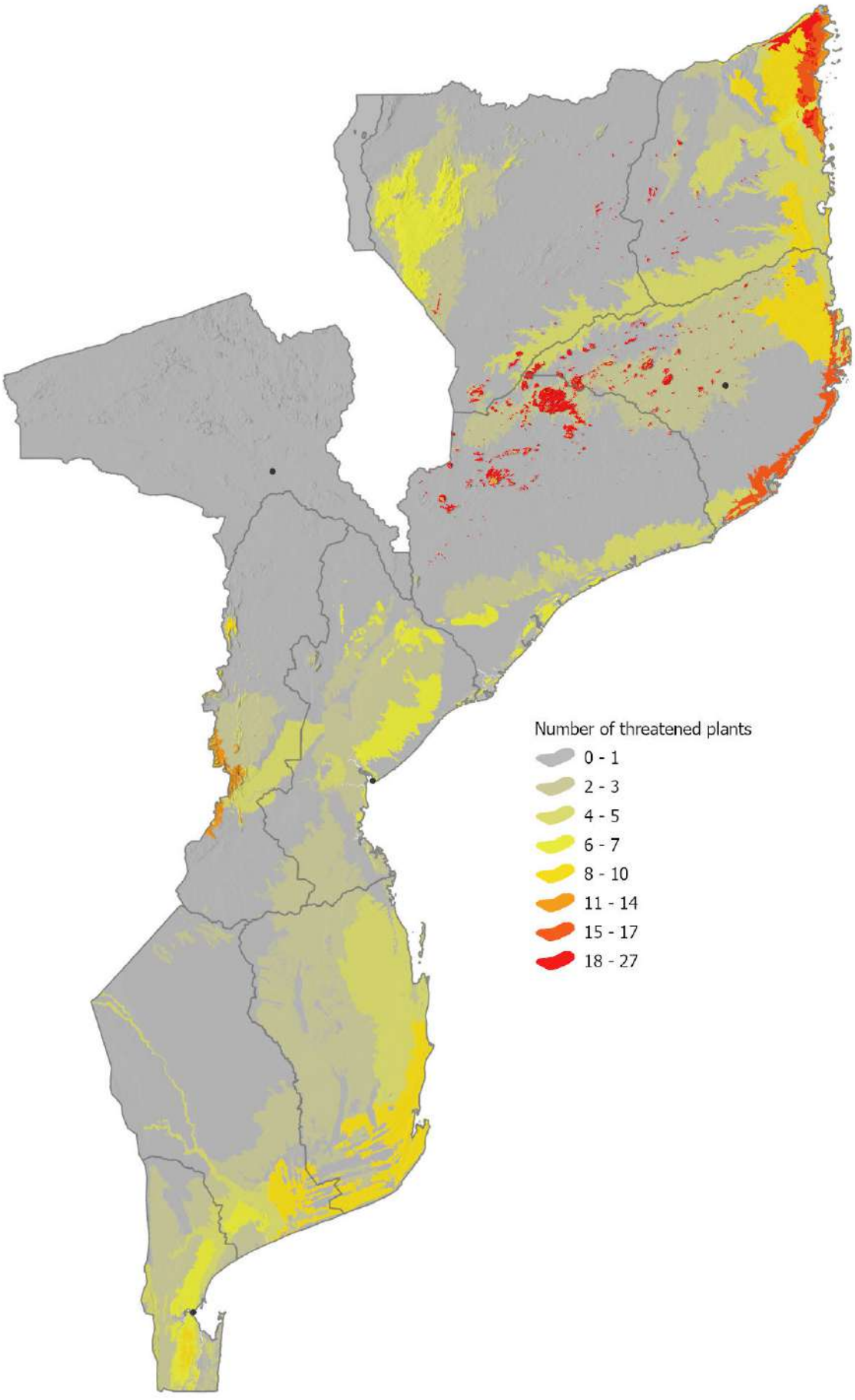


Figure 2.8 – The number of threatened plant species per ecosystem/vegetation unit.

3. ECOSYSTEM DESCRIPTION AND ASSESSMENT

Ecosystem accounts provided in this section consist of two components, an ecosystem description and a detailed summary of the application of the IUCN Red List of Ecosystem criteria.

The ecosystem description follows the standard format suggested by the IUCN (Table 3.1). Ecosystem descriptions are an essential component of IUCN Red List of Ecosystems assessments and serve the purpose of clearly defining each assessment unit. This allows repeated application of the categories and criteria to a single defined unit and supports red listing and cross-walking at the global scale.

The associated assessment section provides the results of the initial Red List assessments, which should be considered as preliminary, considering that further expert engagement is necessary to finalise it.

Table 3.1 – Standard format suggested by the IUCN for the ecosystem description.

Component	Description
Authors	Authors of the description and the assessment.
Portuguese ecosystem names	Alternative Portuguese name of the ecosystem.
Biome	Biome membership according to the global ecosystem typology.
Functional group	Functional group membership according to the global ecosystem typology.
Global classification	Classification code according to the global ecosystem typology.
Regional Ecosystem	Classification aligned with recent work on the Zonal Biomes of Southern Africa
Description	General overview of the principal components and dynamics of the ecosystem. Includes a photograph of the ecosystem.
Distribution	Short written description and range map of the spatial distribution of the ecosystem.
Characteristic native biota	Identifies the defining biotic features of the ecosystem, including diagnostic native taxa, functional components of the characteristic biota.
Abiotic environment and climate	Identifies the defining abiotic features of the ecosystem, including descriptions of the characteristic states or summary of values of the key abiotic variables. Climate is described in detail in climate diagrams (see Fig1.16).
Endemic Plant Species	Plant species endemic to the vegetation type or Mozambique. EN: Endemic - only occurring within unit or Mozambique NE: Near Endemic - defined by one or more of the following criteria: (a) the majority of the taxon's range lies within Mozambique, and they are scarce and/ or highly range-restricted beyond; and/or (b) the global range of the taxon is less than 10,000 km2; and/or (c) the taxon is known globally from five or fewer localities.
Threatened Plant Species	IUCN Red Listed Plant Species recorded in vegetation unit. CR: Critically Endangered; EN: Endangered; VU: Vulnerable.
Biogeographic Anomalies	A plant species that has an unusual occurrence in this unit which may be very far from its typical area of occurrence and thus represents an unusual occurrence not easily explained. It is of biogeographic and conservation importance.
*	A species recorded in only 1 (one) vegetation unit in Mozambique. Often these are species endemic to only this vegetation unit, but it may also occur outside of Mozambique.

3.1 Ecosystem description

Approach to subdivision of ecosystems

The below ecosystems are broken into sections based on the IUCN Realms. They are then ordered according to Biomes and then Ecoregional Functional Groups.

3.1.1 Realm Terrestrial

3.1.1.1 Biome: T1 Tropical-subtropical forests

T1.1 Tropical-subtropical lowland rainforests

AMATONGA LOWLAND SEMIDECIDUOUS FOREST

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Floresta semidecidua das terras baixas de Amatonga
Biome Tropical-subtropical forests (T1)
Functional group Tropical-subtropical lowland rainforests (T1.1)
Regional Ecosystem African Subtropical Coastal Forest

Description

Tall semi-deciduous moist forest.

Distribution

Confined to Mozambique, between Gondola and Moribane, much of it destroyed and therefore poorly known. Occurring in Manica Province.

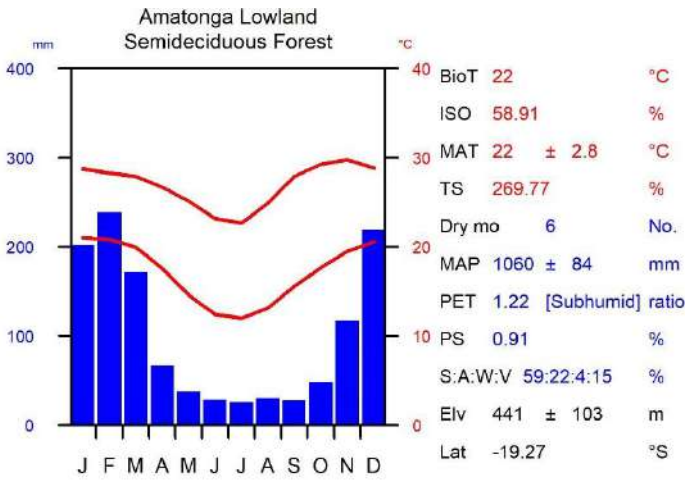
Characteristic native biota

Composition characterized by *Newtonia buchananii, Albizia adianthifolia, Blighia unijugata, Celtis gomphophylla, Chrysophyllum gorungosanum, Croton sylvaticus, Erythrophleum suaveolens, Funtumia africana, Millettia stuhlmannii, Rawsonia lucida, Synsepalum brevipes, Tabernaemontana stapfiana, T. ventricosum, Trilepisium madagascariense* and, near streams, *Khaya anthotheca*. *Harungana madagascariensis* and *Gouania longispicata* are characteristic forest margin species. The understorey includes *Chazaliella abrupta, Costus afer, Dictyophleba lucida, Dovyalis macrocalyx, Dracaena fragrans, Monanthotaxis trichocarpa, Oncinotis tenuiloba, Rinorea arborea, Saba comorensis,* and *Strophanthus courmontii.* Old trees often with abundant epiphytes (ferns, orchids).

Abiotic environment and climate

Altitude range of 171 to 680 m asl with a mean of 441 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 60.0 while the similarly measured clay content is 26.0%. Soil pH is 5.8.

Precipitation during driest quarter is 52.2 mm.



Species of Conservation Importance: none recorded.

RLE Assessment

Assessment Summary

This ecosystem is confined to Mozambique, between Gondola and Moribane. While historical declines of around 30% have been observed, the ecosystem still has a relatively large distribution and faces generally low degradation levels.

Least Concern

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 29.33% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 215 10 x 10 km grid cells and an EOO of 24142.72 km^2. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.5% of the current distribution faces >90 percent degradation severity, 7.13% of the distribution faces >70 percent degradation severity, and 39.01% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

BILENE COASTAL FOREST

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Floresta costeira do Bilene

Biome Tropical-subtropical forests (T1)

Functional group Tropical-subtropical lowland rainforests (T1.1)

Regional Ecosystem African Subtropical Coastal Forest

Description

A semi-deciduous forest 15-20 m high, with *Albizia* spp. often dominant and deciduous. The understorey is species-rich and largely evergreen.

Distribution

Confined to Mozambique. Occurring in Gaza, Inhambane and Maputo Provinces.

Characteristic native biota

Canopy trees are mainly *Afzelia quanzensis, Albizia adianthifolia, A. versicolor, Apodytes dimidiata, Balanites maughamii, Brachylaena discolor, Celtis africana, Chaetachme aristata, Dialium schlechteri, Diospyros inhacaensis, D. natalensis, Erythrophleum suaveolens, Ficus natalensis, Filicium decipiens, Hymenocardia ulmoides, Lannea antiscorbutica, Manilkara discolor, Morus mesozygia, Pteleopsis myrtifolia, Sclerocroton integerrimus, Strychnos gerrardii*, and *Zanthoxylum capense. Trema orientalis* occurs in areas of disturbance.

Small trees and woody shrubs are diverse in these forests, with those recorded being *Allophylus mossambicensis, Anisotes pubinervius, Callichilia orientalis, Coffea racemosa, Combretum pisoniiflorum, Coptosperma supra-axillare, Craibia zimmermannii, Dovyalis longispina, Dracaena aletriformis, D. mannii, Empogona coriacea, Erythroxylum emarginatum, Euclea natalensis* subsp. *natalensis, Lagynias lasiantha, Margaritaria discoidea* var. *nitida, Millettia ebenifera, Monodora junodii* var. *macrantha, Pavetta gerstneri, Peddiea africana, Phyllanthus welwitschianus, Psychotria amboniana* subsp. *mosambicensis, P. capensis, Psydrax locuples, Rytigynia umbellulata, Sphaerocoryne gracilis* subsp. *gracile, Suregada zanzibarensis, Tabernaemontana elegans, Tarenna junodii, T. pavettoides, Tecomaria capensis,* and *Vangueria randii* subsp. *chartacea.* The small tree, *Memecylon incisilobum* is known only from these forests.

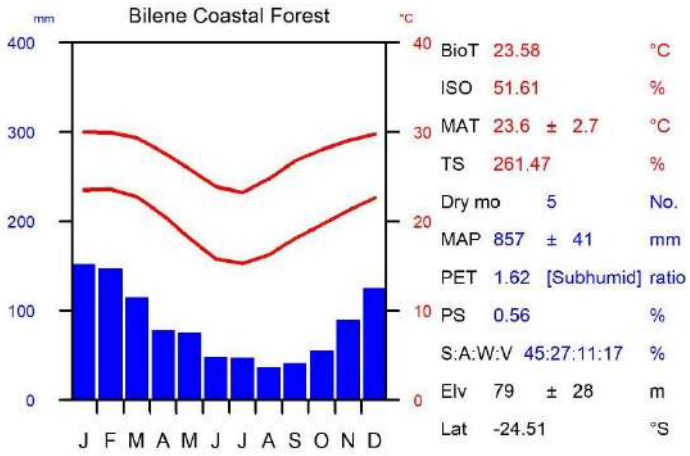
Creepers and lianes may be frequent and include *Abrus precatorius, Adenopodia schlechteri, Ancylobotrys petersiana, Artabotrys monteiroi, Asparagus falcatus, A. natalensis, A. setaceus, Clerodendrum cephalanthum* subsp. *swynnertonii, Dalbergia obovata, Dichapetalum madagascariense, Grewia caffra, Jasminum meyeri-johannis, Landolphia kirkii, Monanthotaxis caffra*, and *Rhoicissus* spp.

The ground layer includes such species as *Aneilema aequinoctiale, Asparagus densiflorus, A. virgatus, Coleotrype natalensis, Commelina erecta* subsp. *livingstonii, Geophila obvallata* subsp. *ioides, Laportea peduncularis* subsp. *latidens*, and *Zamioculcas zamiifolia*. Grasses are few or absent.

Abiotic environment and climate

Altitude range of 23 to 145 m asl with a mean of 79 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 74.9% while the similarly measured clay content is 15.3%. Soil pH is 5.8.

Precipitation during driest quarter is 80.2 mm.



Species of Conservation Importance

Endemic Plant Species

Allophylus mossambicensis [NE], *Memecylon incisilobum* [E*], *Millettia ebenifera* [NE], *Pachystigma* sp. A of FZ [E].

Threatened Plant Species

Allophylus mossambicensis [VU], *Memecylon incisilobum* [CR*], *Psychotria amboniana* subsp. *mosambicensis* [VU].

Biogeographic Anomalies

In addition to the above, *Dichapetalum madagascariense* and *Jasminum meyeri-johannis* are two rare species that reach their southern limit in these forests.

Photographic credits *left*: forest interior near Bilene, Gaza Province. photo: J. Burrows; *right*: interior of Bilene Coastal Forest. photo: M. Soares.

RLE Assessment

Assessment Summary

This ecosystem is confined to the Gaza, Inhambane and Maputo Provinces of Mozambique. While historical declines of around 26% have been observed, the ecosystem still has a relatively large distribution and faces generally low degradation levels. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 26.14% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 96 10 x 10 km grid cells and an EOO of 15938.55 km2. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.16% of the current distribution faces >90 percent degradation severity, 2.23% of the distribution faces >70 percent degradation severity, and 30.06% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

CENTRAL LOWLAND MOIST FOREST

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Floresta húmida das terras baixas do centro

Biome Tropical-subtropical forests (T1)

Functional group Tropical-subtropical lowland rainforests (T1.1)

Regional Ecosystem African Subtropical Coastal Forest

Description

Tall evergreen moist forest at low altitudes below 900 m, occupying rolling foothills, best developed on southern and an eastern aspects.

Distribution

Largely limited to Mozambique but just crossing into Zimbabwe south of the Chimanimani mountains. Occurring in Manica and Zambezia Provinces.

Characteristic native biota

The main canopy trees recorded are *Albizia adianthifolia, Bivinia jalbertii, Celtis gomphophylla, Croton sylvaticus, Erythrophleum suaveolens, Ficus mucuso, Macaranga mellifera, Maranthes goetzeniana, Millettia stuhlmannii, Newtonia buchananii, Pteleopsis myrtifolia, Synsepalum brevipes* and, near streams, *Khaya anthotheca* and *Uapaca lissopyrena.* Smaller subcanopy trees include *Aida micrantha, Englerophytum magalismontanum, Funtumia africana, Rawsonia lucida, Rinorea arborea, R. ferruginea, Rothmannia manganjae, Scolopia zeyheri* and *Tabernaemontana ventricosa.* The rare bamboo, *Oreobambos buchwaldii,* has been recorded in these forests.

Pioneer species that colonise disturbed areas include *Dracaena mannii, Harungana madagascariensis, Macaranga capensis, Trema orientalis, Polyscias fulva, Albizia adianthifolia, A. gummifera* and, in wetter sites, *Anthocleista grandiflora.*

Small trees and shrubs include *Allophylus rubifolius* var. *alnifolius, Argomuellera macrophylla, Clutia abyssinica, Cola greenwayi, Leptactina platyphylla, Maesa rufescens, Pavonia columella* (forest margins), *Psychotria angustibracteata, P. capensis* subsp. *capensis, Tarenna pavettoides* subsp. *affinis, Tricalysia pallens, Vangueria esculenta*, and *Vitex buchananii*.

Climbers and lianes are numerous and include *Acacia pentagona, Agelaea pentagyna, Alafia orientalis, Clerodendrum cephalanthum* subsp. *swynnertonii, Culcasia falcifolia, Dictyophleba lucida, Gouania longispicata, Landolphia buchananii, Mezoneuron angolense, Mucuna pruriens, Mussaenda arcuata, Oncinotis tenuiloba, Pseudocalyx saccatus, Salacia stuhlmannii, Strophanthus courmontii, Tiliacora funifera* and *Urera hypselodendron.*

Herbaceous species and ferns recorded are *Aframomum* spp., *Aneilema aequinoctiale, A. nyasense, Asparagus setaceus, Asplenium parablastophorum, Asystasia gangetica, Bolbitis gemmifera, Costus afer, Ctenitis cirrhosa, Desmodium*

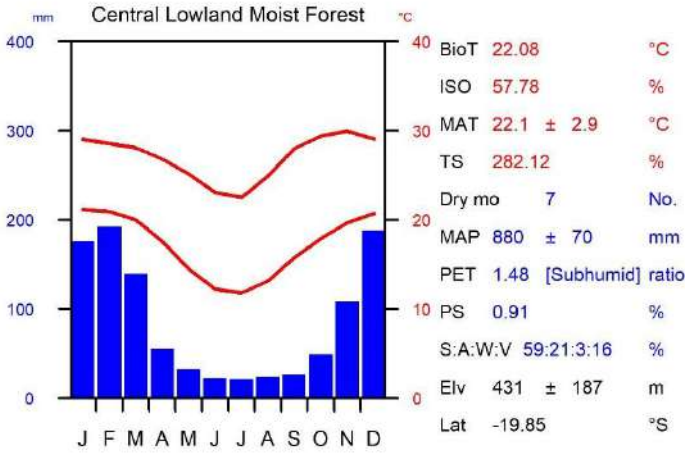
gangeticum, Geophila obvallata, Piper capense, P. umbellatum, Pseuderanthemum sp., *Zamioculcas zamiifolia,* and the common grass *Olyra latifolia.*

The main diagnostic forest trees on Mt Morrumbala where this forest type occurs include *Albizia adianthifolia, A. gummifera, Anthocleista grandiflora, Bersama abyssinica, Chrysophyllum gorungosanum, Cryptocarya liebertiana, Cussonia spicata, Diospyros natalensis, Dracaena steudneri, Ficus polita* subsp. *polita, F. sansibarica* (probably actually *F. chirindensis), Macaranga capensis, Myrianthus holstii, Newtonia buchananii, Strombosia scheffleri, Trema orientalis*, and *Trilepisium madagascariensis.*

Abiotic environment and climate

Altitude range of 175 to 893 m asl with a mean of 431 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 50.8% while the similarly measured clay content is 31.1%. Soil pH is 5.7.

Precipitation during driest quarter is 41.7 mm.



Species of Conservation Importance

Endemic Plant Species

Afrocanthium ngoni [NE], *Aloe ballii* var. *makurupiniensis* [NE*], *Selago swynnertonii* var. *leiophylla* [NE], *Streptocarpus acicularis* [E*], *Synsepalum chimanimani* [NE*], *Tephrosia longipes* var. *swynnertonii* [NE], *Vepris drummondii* [NE*].

Threatened Plant Species

Afrocanthium ngoni [VU], *Aloe ballii* var. *makurupiniensis* [VU*], *Streptocarpus acicularis* [CR*], *Synsepalum chimanimani* [EN*], *Vepris drummondii* [VU*].

Biogeographic Anomalies

Asplenium parablastophorum, *Bolbitis gemmifera*, *Ficus mucuso*, *Oreobambus buchwaldii* are all very rare species with disjunct distributions.

Photographic credits *top*: Moribane Forest in 2004, Chimanimani National Park, Manica Province. photo: S. Burrows; *bottom*: Moribane Forest, Chimanimani National Park, Manica Province. photo: M. Lotter.

RLE Assessment

Assessment Summary	Assessment Information
This ecosystem is largely limited to Mozambique but just crossing into Zimbabwe south of the Chimanimani mountains. It has a restricted distribution, with evidence of ongoing declines and widespread degradation. **Vulnerable**	**Criterion A:** Expansion of urban areas, agriculture & deforestation has caused a 40.64% decline since 1750. Least Concern **Criterion B:** This ecosystem has an AOO of 40 10 x 10 km grid cells and an EOO of 42997.31 km2. It has undergone substantial historical decline, and there is evidence that deforestation & other threats are leading to continuing decline. Vulnerable **Criterion C:** Not evaluated **Criterion D:** Degradation assessment shows that 62.85% of the current distribution faces >90 percent degradation severity, 81.65% of the distribution faces >70 percent degradation severity, and 99.58% of the distribution faces >50 percent degradation severity. Vulnerable **Criterion E:** Not evaluated

CENTRAL MID-ELEVATION MOIST FOREST

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Floresta húmida de media altitude do centro

Biome Tropical-subtropical forests (T1)

Functional group Tropical-subtropical lowland rainforests (T1.1)

Regional Ecosystem African Subtropical Coastal Forest

Description

Moist evergreen forest to c. 30 m tall, at medium altitudes of between 900 and 1300 m, mainly on southern and eastern aspects.

Distribution

Partly confined to central Mozambique, also in the eastern Zimbabwe highlands. Occurring in Manica, Sofala and Zambezia Provinces.

Characteristic native biota

On Mt Gorongosa this unit is found between 900 and 1300m and characterized by *Newtonia buchananii*, which is often dominant at lower altitudes. Other typical canopy species are *Albizia gummifera, Chrysophyllum gorungosanum, Craibia brevicaudata, Croton sylvaticus, Diospyros abyssinica, Drypetes gerrardii, Ekebergia capensis, Ficus chirindensis, F. craterostoma, F. scassellatii, Margaritaria discoidea* var. *nitida, Strombosia scheffleri* and *Trichilia dregeana*. *Ocotea kenyensis* and *Khaya anthotheca* are rare. Species characteristic of disturbed sites are *Albizia gummifera, Anthocleista grandiflora, Macaranga mellifera, Polyscias fulva, Rauvolfia caffra and Shirakiopsis elliptica*.

Common in the sub-canopy and sapling layer are *Aidia micrantha, Cola greenwayi, Heinsenia diervilleoides, Garcinia kingaensis, Ochna arborea, Oxyanthus speciosus, Rawsonia lucida, Rothmannia urcelliformis, Strychnos usambarensis, Vangueria esculenta* and *Vepris bachmannii*. In the well-defined shrub layer *Dracaena fragrans* is often dominant.

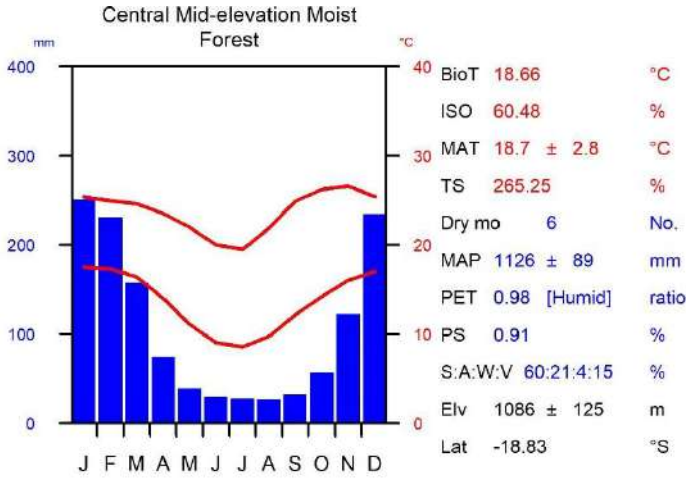
Characteristic shrubs are *Allophylus chaunostachys, Argomuellera macrophylla, Clerodendrum pleiosciadium, Cremaspora triflora, Dracaena mannii, Mellera lobulata, Psychotria capensis* subsp. *capensis, Rinorea ferruginea, Rutidea orientalis, Rytigynia uhligii, Tarenna pavettoides* and *Tricalysia pallens*. Other shrubs include *Achyrospermum carvalhi, Carissa bispinosa* subsp. *zambeziensis, Coffea ligustroides, Diospyros ferrea, Justicia betonica, Mostuea brunonis, Peddiea africana, Psychotria zombamontana* and *Rytigynia macrura*.

Lianes are numerous, including *Acacia pentagona, Agelaea pentagyna, Clerodendrum cephalanthum* subsp. *swynnertonii, Combretum paniculatum, Embelia schimperi, Gouania longispicata, Hippocratea africana* var. *richardiana, Landolphia buchananii, L. kirki, Oncinotis tenuiloba, Strychnos lucens* and *Tiliacora funifera*. The ground cover is dense with *Pseuderanthemum subviscosum* and *Aframomum angustifolium* abundant. Common grass species are *Isachne mauritiana, Leptaspis cochleata, Oplismenus compositus, O. hirtellus, Poecilostachys oplismenioides* and *Setaria megaphylla.*

Abiotic environment and climate

Altitude range of 838 to 1354 m asl with a mean of 1086 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 46.0% while the similarly measured clay content is 33.4%. Soil pH is 5.6.

Precipitation during driest quarter is 67 mm.



Species of Conservation Importance

Endemic Plant Species

Barleria fissimuroides [NE*], *Impatiens psychadelphoides* [NE].

Threatened Plant Species

Barleria fissimuroides [EN*], *Impatiens psychadelphoides* [VU], *Tannodia swynnertonii* [VU].

Photographic credits *top*: lower slopes of Mt Gorongosa, Sofala Province. photo: M. Lotter; *bottom left*: lower slopes of Mt Gorongosa. photo: J. Burrows; *bottom right*: lower slopes of Mt Gorongosa, Sofala Province. photo: M. Lotter.

RLE Assessment

Assessment Summary

Partly confined to central Mozambique, but also found in the eastern Zimbabwe highlands. This ecosystem has undergone a 26% decline in extent and is facing widespread degradation. **Vulnerable**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 26.22% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 35 10 x 10 km grid cells and an EOO of 37044.61 km2. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 34.28% of the current distribution faces >90 percent degradation severity, 65.74% of the distribution faces >70 percent degradation severity, and 100.62% of the distribution faces >50 percent degradation severity. Vulnerable

Criterion E: Not evaluated

CHERINGOMA LIMESTONE GORGE FOREST

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Floresta do desfiladeiro calcárico de Cheringoma

Biome Tropical-subtropical forests (T1)

Functional group Tropical-subtropical lowland rainforests (T1.1)

Regional Ecosystem African Subtropical Coastal Forest

Description

A tall, sheltered forest protected within the deep limestone gorges on the western edge of the Cheringoma Plateau, Sofala Province.

Distribution

Limited to edge of Cheringoma Plateau. Occurring in Sofala Province.

Characteristic native biota

Characteristic tree species include *Albizia glaberrima, Antiaris toxicaria* subsp. *welwitschii, Bivinia jalbertii, Bombax rhodognaphalon, Breonadia salicina, Celtis africana, C. gomphophylla, Ficus craterostoma, F. lutea, F. polita, F. sur, Funtumia africana, Inhambanella henriquesii, Khaya anthotheca, Lannea antiscorbutica, Mimusops obtusifolia, Milicia excelsa, Mimusops obtusifolia, Morus mesozygia, Pancovia golungensis, Terminalia sambesiaca, Turraea zambesica, and Zanha golungensis*.

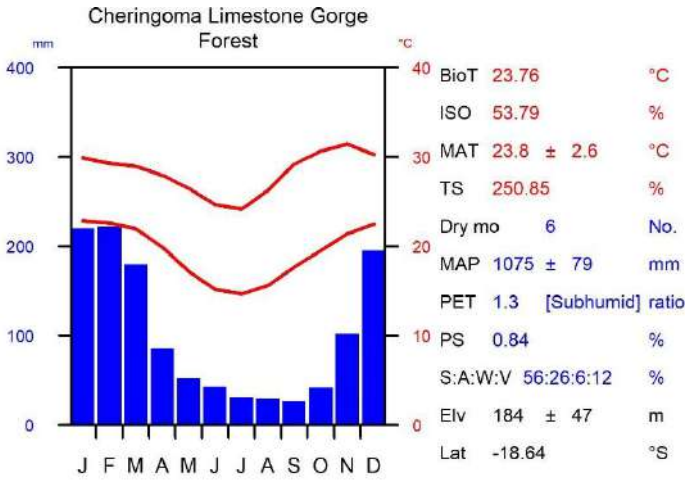
Smaller trees and large woody shrub species include: *Combretum pisoniiflorum, Coptosperma nigrescens, Euclea schimperi, Garcinia livingstonei, Grandidiera boivinii, Gymnosporia mossambicensis, Ficus exasperata, Lasiodiscus pervillei* subsp. *pervillei, Ludia mauritiana, Monanthotaxis trichocarpa, Pavetta klotzschiana, Rawsonia lucida, Rinorea arborea, Strychnos henningsii, Suregada zanzibarensis, and Tannodia tenuifolia* var. *tenuifolia*

Climbers and lianes are common and include *Entada chrysostachya, Flagellaria guineense, Hippocratea africana, Saba comorensis, Tiliacora funifera, Toddaliopsis asiatica* and *Urera sansibarica*.
The moist limestone/tufa faces are clothed in *Adiantum capillus-veneris* and ferns are generally abundant along the shaded streams.

Abiotic environment and climate

Altitude range of 81 to 280 m asl with a mean of 184 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 57.6% while the similarly measured clay content is 25.4%. Soil pH is 5.9.

Precipitation during driest quarter is 64.1 mm.



Species of Conservation Importance

Endemic Plant Species

Agelanthus igneus [NE*], *Cola cheringoma* [E].

Threatened Plant Species

Agelanthus igneus [EN*], *Cola cheringoma* [EN].

Biogeographic Anomalies

Important biogeographic species include *Albizia isenbergiana, Antiaris toxicaria* subsp. *welwitschii, Celtis philippensis, Grandidiera boivinii, Ludia mauritiana* and *Pisonia aculeata*. The moist banks of the streams in the gorges support two very rare ferns; *Amblovenatum opulentum* (*Thelypteris opulenta*) and *Sphaerostephanus unitus (Thelypteris unita),* the former the only locality in the *Flora Zambesiaca* region.

Photographic credits *top left*: limestone gorge. photo: M. Stalmans; *top right*: Nhamfisse limestone gorge. photo: J. Burrows; *bottom*: Mazamba Gorge, western Cheringoma Plateau, Sofala Province. photo: J. Burrows

RLE Assessment

Assessment Summary	Assessment Information
This ecosystem has a very restricted geographic distribution (EOO ~500km2), but there is little evidence of continuing ongoing declines. However, moderate degradation levels are present across almost the entire distribution of the ecosystem. **Vulnerable**	**Criterion A:** Expansion of urban areas, agriculture & deforestation has caused a 7.49% decline since 1750. Least Concern **Criterion B:** This ecosystem has an AOO of 10 10 x 10 km grid cells and an EOO of 517.08 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern **Criterion C:** Not evaluated **Criterion D:** Degradation assessment shows that 0.31% of the current distribution faces >90 percent degradation severity, 5.81% of the distribution faces >70 percent degradation severity, and 99.47% of the distribution faces >50 percent degradation severity. Vulnerable **Criterion E:** Not evaluated

MAPUTALAND COASTAL FOREST

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Floresta costeira de Maputaland

Biome Tropical-subtropical forests (T1)

Functional group Tropical-subtropical lowland rainforests (T1.1)

Regional Ecosystem African Subtropical Coastal Forest

Description

Evergreen coastal forest.

Distribution

Occurring south of Maputo and into northern KwaZulu-Natal in South Africa. Occurring in Maputo Province.

Characteristic native biota

The trees are dominated by *Acacia kosiensis, Albizia adianthifolia, Brachylaena discolor, Diospyros inhacensis, Dovyalis longispina, Drypetes natalensis, Eugenia capensis, E. natalensis, E. racemosa* var. *sinuata, Gymnosporia nemorosa, Mimusops caffra, Psydrax obovata* subsp. *obovata, Sideroxylon inerme, Trichilia emetica,* and *Vepris lanceolata.*

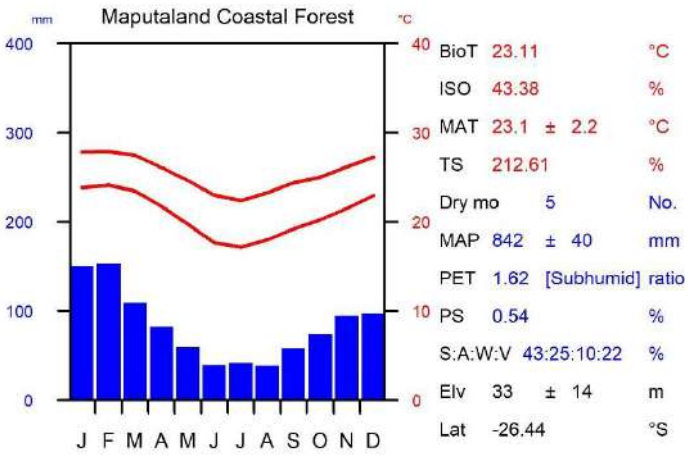
Shrubs are *Acokanthera oblongifolia, Cavacoa aurea, Dracaena aletriformis, Encephalartos ferox, Englerophytum natalense, Peddiea africana, Searsia nebulosa* and *Strelitzia nicolai.* The herbaceous layer typically contains *Asparagus densiflorus*, *A. setaceus*, *Asystasia gangetica, Isoglossa woodii, Microsorum scolopendria,* and *Zamioculcas zamiifolia*.

Climbers include *Artabotrys monteiroi, Distephanus inhacensis, Dalbergia armata, Landolphia kirkii, Monanthotaxis caffra, Rhoicissus tomentosa,* and *Scutia myrtina.*

Abiotic environment

Altitude range of 7 to 71 m asl with a mean of 33 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 71.4.1% while the similarly measured clay content is 17.3%. Soil pH is 5.7.

Precipitation during driest quarter is 96.9 mm.



Species of Conservation Importance

Endemic Plant Species

Acridocarpus natalitius var. *linearifolius* [NE].

Threatened Plant Species

Encephalartos ferox [NT].

Photographic credits Maputo Special Reserve, Maputo Province. photo: M. Stalmans

RLE Assessment

Assessment Summary

Restricted to southern Mozambique and northern South Africa, this ecosystem has a restricted geographic distribution (EOO ~1600km2), but there is little evidence of continuing ongoing declines. However, moderate degradation levels are present across almost the entire distribution of the ecosystem. **Vulnerable**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 3.07% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 20 10 x 10 km grid cells and an EOO of 1660.86 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.68% of the current distribution faces >90 percent degradation severity, 8.59% of the distribution faces >70 percent degradation severity, and 96.92% of the distribution faces >50 percent degradation severity. Vulnerable

Criterion E: Not evaluated

NORTHERN LOWLAND MOIST FOREST

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Floresta húmida das terras baixas do norte

Biome Tropical-subtropical forests (T1)

Functional group Tropical-subtropical lowland rainforests (T1.1)

Regional Ecosystem African Subtropical Coastal Forest

Description

Tall evergreen forest below 900 m in altitude.

Distribution

In high rainfall areas north of the Zambezi River, extending into adjacent Malawi. Occurring in Nampula and Zambezia Provinces, mostly confined to Mozambique.

Characteristic native biota

Tall forest usually dominated by *Newtonia buchananii* (up to 30 m), with *Albizia adianthifolia, Bridelia micrantha, Celtis gomphophylla, Chrysophyllum viridifolium, Croton sylvaticus, Funtumia africana, Khaya anthotheca, Pouteria alnifolia, Rauvolfia caffra, Shirakiopsis elliptica, Sorindeia madagascariensis, Treculia africana, Trichilia dregeana,* and *Trilepisium madagascariense.*

The understorey contains *Antidesma vogelianum, Aporrhiza paniculata, Blighia unijugata, Cola mossambicensis, Garcinia kingaensis, Harungana madagascariensis, Mallotus oppositifolius, Oxyanthus speciosus, Synsepalum brevipes, Tabernaemontana ventricosa,* and *Trema orientalis.*

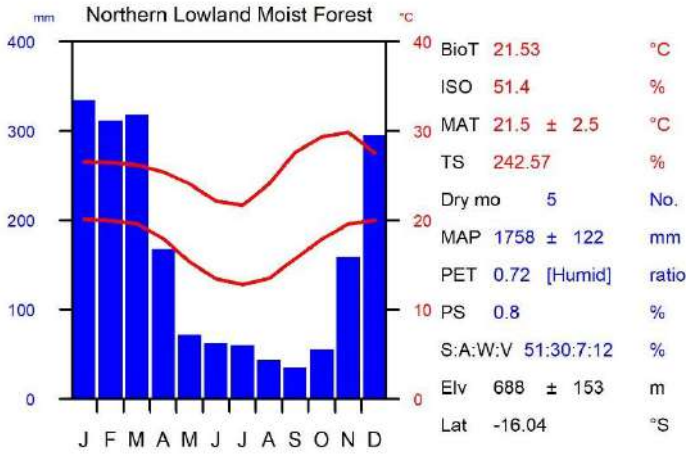
Shrubs include *Acalypha welwitschiana, Coffea salvatrix, Erythrococca polyandra, Pseuderanthemum subviscosum, Rytigynia adenodonta,* and *Tricalysia pallens.*

Climbers recorded are *Acacia pentagona, Combretum paniculatum, Gouania longispicata, Keetia gueinzii, Millettia lasiantha, Oncinotis tenuiloba, Paullinia pinnata, Saba comorensis,* and *Strychnos angolensis.*

Abiotic environment and climate

Altitude range of 373 to 920 m asl with a mean of 700 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 49.9% while the similarly measured clay content is 30.9%. Soil pH is 5.5.

Precipitation during driest quarter is 93.6 mm.



Species of Conservation Importance: none recorded.

RLE Assessment

Assessment Summary

Found in high rainfall areas north of the Zambezi river, this ecosystem has a restricted geographic distribution (AOO = 21 grid cells), but there is little evidence of continuing ongoing declines. However, moderate to high degradation levels are present across almost the entire distribution of the ecosystem. **Vulnerable**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 9.79% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 21 10 x 10 km grid cells and an EOO of 43951.91 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 35.06% of the current distribution faces >90 percent degradation severity, 66.96% of the distribution faces >70 percent degradation severity, and 99.2% of the distribution faces >50 percent degradation severity. Vulnerable

Criterion E: Not evaluated

NORTHERN MID-ELEVATION MOIST FOREST

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Floresta húmida de media altitude do norte

Biome Tropical-subtropical forests (T1)

Functional group Tropical-subtropical lowland rainforests (T1.1)

Regional Ecosystem African Subtropical Coastal Forest

Description

Tall moist evergreen forest with canopy to 45 m, occurring between 900 and 1300m in altitude.

Distribution

In high rainfall areas in mountains north of the Zambezi River, extending into adjacent Malawi. Mt Mabu has the largest extent in the region. Occurring in Nampula, Niassa and Zambezia Provinces, mostly confined to Mozambique.

Characteristic native biota

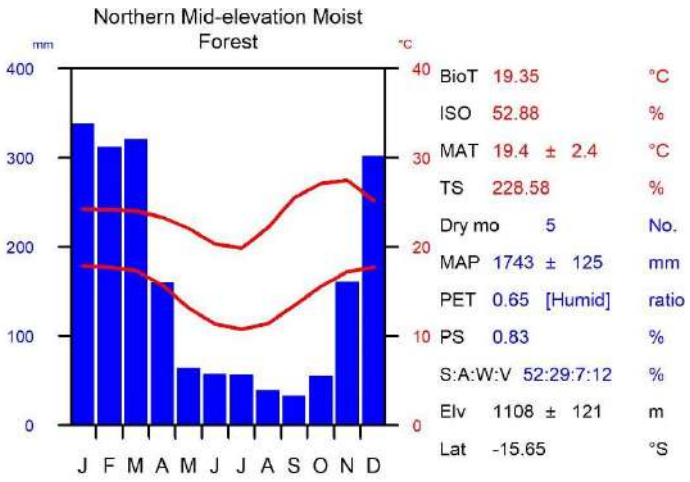
On Mt Mabu the dominants are *Chrysophyllum gorungosanum, Maranthes goetzeniana, Newtonia buchananii,* and *Strombosia scheffleri.,* Less frequent are *Cryptocarya liebertiana, Diospyros abyssinica, Ficus sansibarica, Myrianthus holstii, Trichilia dregeana,* with sub-canopy trees of *Aida micrantha, Drypetes gerrardii, D. natalensis, Funtumia africana, Garcinia kingaensis, Heinsenia diervilleioides, Oxyanthus speciosus, Rawsonia lucida, Tabernaemontana ventricosa, Tricalysia acocantheroides,* with occasional clumps of *Oreobambus buchwaldii* bamboo.

On Mt Namuli this type is of limited extent. With a canopy 20-25 m high, composed of *Albizia gummifera, Chrysophyllum gorungosanum, Englerophytum magalismontanum, Ficus* spp., *Newtonia buchananii,* and *Synsepalum muelleri.* Shrubs or climbers include *Agelaea pentagyna, Pavetta chapmanii,* and *Millettia lasiantha*.

Abiotic environment

Altitude range of 860 to 1310 m asl with a mean of 1108 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 48.9% while the similarly measured clay content is 31.6%. Soil pH is 5.4.

Precipitation during driest quarter is 86.4 mm.



Species of Conservation Importance

Endemic Plant Species

Encephalartos gratus [NE], *Pavetta chapmanii* [NE], *Plectranthus guruensis* [E], *Polysphaeria ribauensis* [E*], *Vepris macedoi* [E].

Threatened Plant Species

Encephalartos gratus [VU], *Plectranthus guruensis* [EN], *Polysphaeria ribauensis* [EN*], *Vepris macedoi* [EN].

Photographic credits *left*: Mt Lico, Zambezia Province. photo: J. Timberlake; *right*: Mt Mabu, Zambezia Province. photo. J. Timberlake.

RLE Assessment

Assessment Summary

Found in mountainous, high rainfall areas north of the Zambezi river, this ecosystem has a restricted geographic distribution (AOO = 30 grid cells), but there is little evidence of continuing ongoing declines. However, moderate to high degradation levels are present across almost the entire distribution of the ecosystem. **Vulnerable**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 10.57% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 30 10 x 10 km grid cells and an EOO of 72103.92 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 20.41% of the current distribution faces >90 percent degradation severity, 53.58% of the distribution faces >70 percent degradation severity, and 95.76% of the distribution faces >50 percent degradation severity. Vulnerable

Criterion E: Not evaluated

ZAMBEZI DELTA LOWLAND FOREST

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Floresta das terras baixas do Delta do Zambeze
Biome Tropical-subtropical forests (T1)
Functional group Tropical-subtropical lowland rainforests (T1.1)
Regional Ecosystem African Subtropical Coastal Forest

Description

Tall dense forest, trees to 20-25 m tall, deciduous, only some partially evergreen, with scattered dambos.

Distribution

Confined to the high-rainfall hill on either side of the Zambezi delta. Occurring in Sofala and Zambezia Provinces.

Characteristic native biota

The main tree species are *Millettia stuhlmannii* and *Pteleopsis myrtifolia*, with *Afzelia quanzensis, Balanites maughamii, Berchemia zeyheri, Brachystegia spiciformis, Burkea africana, Celtis mildbraedii, Cleistanthus schlechteri, Erythrophleum suaveolens, Inhambanella henriquesi, Lecaniodiscus fraxinifolius, Milicia excelsa, Morus mesozygia, Parinari curatellifolia, Sclerocarya birrea* subsp. *caffra, Sterculia appendiculata* and *Strychnos potatorum*. The understorey of smaller trees and shrubs is comprised of *Alchornea laxiflora, Cola mossambicensis, Drypetes natalensis, Hunteria zeylanica, Millettia mossambicensis, Rinorea arborea, Salacia madagascarensis, Strychnos mitis, S. usambarensis, Suregada zanzibarensis*, and *Tapura fischeri.*

The miombo woodland element is dominated by *Brachystegia spiciformis, B. boehmii* and *Julbernardia globiflora*, with *Albizia adianthifolia, Hirtella zanguebarica, Millettia stuhlmannii, Vitex doniana*, and the smaller trees and shrubs of the understorey including *Casearia gladiiformis, Cleistochlamys kirkii, Diospyros verrucosa, Glyphaea tomentosa, Leptactina delagoensis, Millettia usaramensis, Monanthotaxis buchananii, Pavetta refractifolia, Polyalthia mossambicensis, Rytigynia umbellulata, Strychnos myrtoides, Synaptolepis alternifolia, Tarenna junodii, T. longipedicellata* and *Xylopia gracilipes.*

Lianes and climbers include *Artabotrys brachypetalus, Dalbergia arbutifolia*, and *Flagellaria guineense.*

Along the streams and rivers is a riparian forest belt of *Albizia glaberrima* subsp. *glabrescens, Breonadia salicina, Cordyla africana, Erythrophleum suaveolens, Homalium abdessammadii, Phoenix reclinata, Pandanus kirkii, Parkia filicoidea, Treculia africana, Trichilia emetica* and climbers such as *Entada rheedii* and *Saba comorensis.*

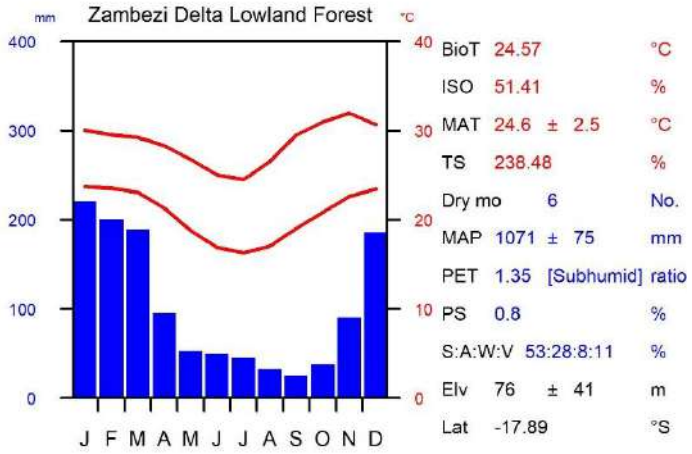
The open areas which tend to be at slightly lower altitudes are represented by trees such as *Acacia polyacantha* subsp. *campylacantha, A. robusta* var. *usambarensis, A. sieberiana* var. *woodii, Antidesma venosum, Combretum collinum, Crossopteryx febrifuga, Dalbergia boehmii, D. melanoxylon, D. nitidula, Ekebergia benguelensis, Entada abyssinica, Erythrina abyssinica, Garcinia livingstonei, Hyphaene coriacea, Pericopsis angolensis, Sterculia africana, Trichilia capitata* and *Ziziphus mucronata*. Small trees and shrubs include *Annona senegalensis, Dichrostachys cinerea, Grewia transzambesica, Maerua angolensis, Vangueria infausta, Ximenia americana* subsp. *microphylla, and X. caffra* subsp. *natalensis*

The ground layer is sparse to absent and composed of grasses (*Eragrostis hiemiana, Hyparrhenia rufa*), *Pteridium aquilinum, Aframomum alboviolaceum* and low shrubs such as *Crotalaria* spp. (*C. capensis, C. cleomifolia, C. virgulata*), *Eriosema psoraleoides, Indigofera paniculata, Chamaecrista absus* and *C. mimosoides*. This often forms a mosaic with dense miombo woodland with *Brachystegia* and understorey of forest shrubs, but confined to slightly higher terrain. Circular pans (or dambos) are a feature in places, with a gradient from dry forest through *Brachystegia* woodland to grassland, sedges and occasionally open water. These dambos have not been mapped as a separate azonal feature, as they should be. *Brachystegia* spp. and *Hyphaene coriacea* palms occur on the outer edge of the dambos, with *Eriochloa procera*, *Hemarthria altissima, Hyparrhenia* spp., *Imperata afrum, Cyperus papyrus, Phragmites australis*, and/or *Typha latifolia* occurring in the dambos. The floating *Nymphaea* spp. and *Nymphoides* spp. occur in shallow standing water.

Abiotic environment and climate

Altitude range of 11 to 186 m asl with a mean of 76 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 64.3% while the similarly measured clay content is 21.3%. Soil pH is 6.0.

Precipitation during driest quarter is 53.6 mm.



Species of Conservation Importance

Endemic Plant Species

Pavetta pumila [NE], *Siphonochilus kilimanensis* [NE], *Tarenna longipedicellata* [NE].

Threatened Plant Species

Pavetta pumila [VU], *Siphonochilus kilimanensis* [VU], *Tarenna longipedicellata* [VU].

Photographic credits Coutada 11, Inhaminga town, Cheringoma District, Sofala Province. photo: M. Stalmans.

RLE Assessment

Assessment Summary

Restricted to Mozambique, found on the high-rainfall hill on either side of the Zambezi delta. This ecosystem has a restricted geographic distribution (EOO = 22000km2), but there is little evidence of continuing ongoing declines. However, moderate degradation levels are present across almost the entire distribution of the ecosystem. **Vulnerable**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 23.31% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 141 10 x 10 km grid cells and an EOO of 22802.06 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 20.92% of the current distribution faces >90 percent degradation severity, 40.42% of the distribution faces >70 percent degradation severity, and 92.38% of the distribution faces >50 percent degradation severity. Vulnerable

Criterion E: Not evaluated

T1.2 Tropical-subtropical dry forests and thickets

LEBOMBO-KWAZULU NATAL SCARP FOREST

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Floresta da escarpa Lebombo-KwaZulu Natal

Biome Tropical-subtropical forests (T1)

Functional group Tropical-subtropical dry forests and thickets (T1.2)

Regional Ecosystem African Subtropical Coastal Forest

Description

Short to medium closed-canopy forest 12-17 m tall at altitudes of below 670 m.

Distribution

Occurring along the eastern slopes of the Lebombo Mountains in Eswatini, South Africa and Mozambique. Occurring in Maputo Province.

Characteristic native biota

Dominant trees include *Aloidendron barberae, Apodytes dimidiata, Atalaya alata, Celtis africana, Chaetachme aristata, Chionanthus foveolatus* subsp. *foveolatus, Combretum woodii, Cryptocarya woodii, Cussonia spicata, Diospyros natalensis, Erythrophleum lasianthum, Harpephyllum caffrum, Homalium dentatum, Manilkara concolor, Mimusops zeyheri, Olea europaea* subsp. *africana, Ptaeroxylon obliquum, Strychnos mitis, S. gerrardii, S. usambarensis, Vitellariopsis marginata, Wrightia natalensis,* and *Zanthoxylum capense,*

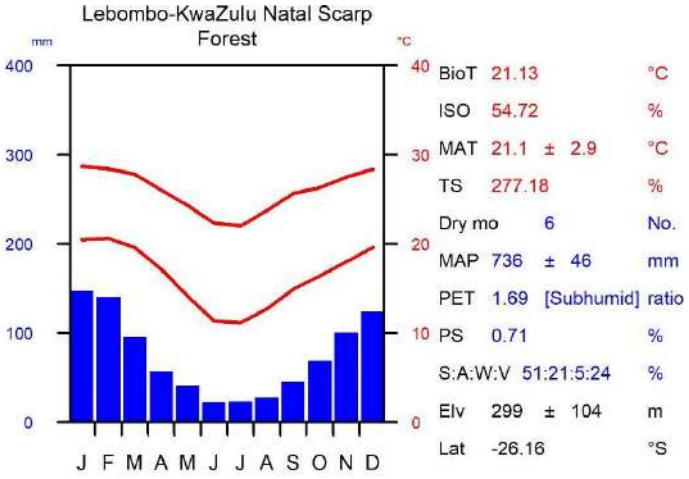
Other trees and shrubs are *Acacia ataxacantha, A. brevispica* subsp. *dregeana, Acalypha glabrata, cridocarpus natalitius* var. *natalitius, Cadaba natalensis, Cassipourea mossambicensis, Cola greenwayi, Coptosperma nigrescens, C. supra-axillare, Cordia caffra, Craibia zimmermannii, Croton gratissimus, C. menyharthii, Diospyros natalensis, Dombeya cymosa, Dracaena aletriformis, Drypetes arguta, Encephalartos umbeluziensis, E. villosus, Erythroxylum emarginatum, Hyperacanthus amoenus, Kraussia floribunda, Maytenus undata, Monanthotaxis caffra, Mystroxylon aethiopicum* subsp. *schlechteri, Ochna arborea* subsp. *arborea, Pavetta gracilifolia, Psychotria capensis* var. *capensis, Rawsonia lucida, Strychnos henningsii, Suregada africana, Vepris gerrardii, V. reflexa, Uvaria lucida,* and *Warburgia salutaris.*

Lianes include *Dalbergia armata, Rhoicissus revoilii, R. tomentosa, Secamone filiformis*, and *Strophanthus gerrardii.* The herbaceous layer includes *Asparagus virgatus, Asystasia gangetica, Isoglossa ciliata, Justicia campylostemon,* and *Oplismenus hirtellus.* In some of the dry river valleys, particularly that of the Umbeluzi River, occur patches of almost pure dry *Androstachys johnsonii* forest which house rarities such as *Dietes flavida* and *Euphorbia baylissii.*

Abiotic environment

Occurring on shallow soils overlying rhyolite. Altitude range of 118 to 665 m asl with a mean of 299 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 45.7% while the similarly measured clay content is 34.7%. Soil pH is 6.0.

Precipitation during driest quarter is 42.4 mm.



Species of Conservation Importance

Endemic Plant Species

Asparagus radiatus [NE], *Bonatea pulchella* [NE], *Encephalartos umbeluziensis* [NE].

Biogeographic Anomalies

Dietes flavida, Encephalartos villosus, *Euphorbia baylissii, Warburgia salutaris.*

Photographic credits Blue Jay Ranch, Lebombo Mts, Eswatini. photo: M. Lotter.

RLE Assessment

Assessment Summary

Found in mountainous areas of South-West Mozambique, this ecosystem has a restricted geographic distribution but there is little evidence of ongoing declines in extent. However, moderate degradation levels are present across almost the entire distribution of the ecosystem. **Vulnerable**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 2.69% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 10 10 x 10 km grid cells and an EOO of 857.37 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.67% of the current distribution faces >90 percent degradation severity, 8.43% of the distribution faces >70 percent degradation severity, and 86.08% of the distribution faces >50 percent degradation severity. Vulnerable

Criterion E: Not evaluated

ICURIA COASTAL FOREST

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Floresta Costeira de Icuria

Biome Tropical-subtropical forests (T1)

Functional group Tropical-subtropical dry forests and thickets (T1.2)

Regional Ecosystem East African Dry Coastal Forest

Description

Usually a medium to tall coastal forest with a dense canopy up to 30 m tall, occasionally reduced to a shorter scrub-forest or thicket, forest dominated by the endemic *Icuria dunensis*. The stem diameter may exceed 2.8 m and densities of up to 200 plants per hectare were recorded. Species diversity of both the canopy and subcanopy is generally quite low (25-40 taxa).

Distribution

Only in Mozambique between Nacala and Moma in Nampula Province. It is still rather poorly known and mapped and may extend beyond this range. Occurring in Nampula Province.

Characteristic native biota

Canopy dominated by *Icuria dunensis* and other less common trees include *Afzelia quanzensis, Albizia anthelmintica, Croton gratissimus, Hexalobus mossambicensis, Pseudobersama mossambicensis,* and *Strychnos madagascariensis*.

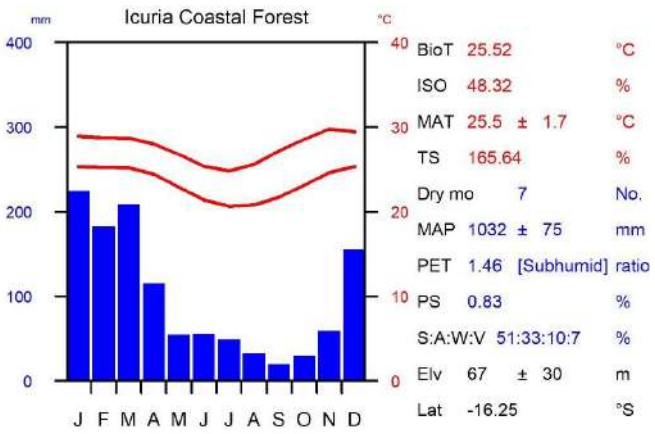
Shrub layer with *Warneckea sessilicarpa, Ochna angustata, Diospyros consolatae, Euclea natalensis* subsp. *obovata, Crossopteryx febrifuga* and *Sclerochiton coeruleus.* Herbaceous layer with *Blepharis dunensis* and *Asparagus falcatus*

The epiphytic fern, *Platycerium alcicorne,* occurs on the forest margins.

Abiotic environment and climate

Altitude range of 10 to 122 m asl with a mean of 67 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 62.9% while the similarly measured clay content is 23.0%. Soil pH is 6.1.

Precipitation during driest quarter is 34.6 mm.



Species of Conservation Importance

Endemic Plant Species

Icuria dunensis [NE], *Warneckea sessilicarpa* [E], *Zanthoxylum tenuipedicellatum* [NE*].

Threatened Plant Species

Agelanthus longipes [VU*], *Icuria dunensis* [EN], *Warneckea sessilicarpa* [CR], *Zanthoxylum tenuipedicellatum* [EN*].

Photographic credits *left & right*: Moma area, Zambezia Province. photos: N. Ribeiro.

RLE Assessment

Assessment Summary

This ecosystem has a highly restricted distribution in coastal areas of Nampula province. There is evidence of considerable historical declines, and deforestation & other threats are leading to continuing ongoing declines. **Endangered**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 65.34% decline since 1750. Vulnerable

Criterion B: This ecosystem has an AOO of 15 10 x 10 km grid cells and an EOO of 7358.18 km2. It has undergone substantial historical decline, and there is evidence that deforestation & other threats are leading to continuing decline. Endangered

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.73% of the current distribution faces >90 percent degradation severity, 10.24% of the distribution faces >70 percent degradation severity, and 75.27% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

MACOMIA LOWLAND DECIDUOUS FOREST

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Floresta decídua das terras baixas de Macomia

Biome Tropical-subtropical forests (T1)

Functional group Tropical-subtropical dry forests and thickets (T1.2)

Regional Ecosystem East African Dry Coastal Forest

Description

A mosaic of two or three communities, ranging from tall semi-deciduous forest to deciduous woodland on sands. The tall forests south and west of Macomia have largely disappeared through logging and subsequent cultivation. Some woodlands are currently nominally protected within Quirimba National Park.

Distribution

Mostly confined to Mozambique, from the Rovuma River southward to Pemba. Occurring in Cabo Delgado Province.

Characteristic native biota

The tall deciduous forest was historically composed of a canopy of *Afzelia quanzensis, Adansonia digitata, Albizia adianthifolia* var. *adianthifolia, A. glaberrima* subsp. *glabrescens, Antiaris toxicaria* subsp. *welwitschii* var. *usambarensis, Bombax rhodognaphalon, Cordyla africana, Dialium holtzii, Ficus* spp. (*bubu, lingua* subsp. *depauperata, lutea, sansibarica* subsp. *sansibarica*), *Milicia excelsa, Millettia stuhlmannii, Pteleopsis myrtifolia, Ricinodendron heudelotii, Sterculia appendiculata, Tannodia swynnertonii*, and *Vitex doniana.*

Associated forest woody species are *Acacia adenocalyx, Combretum paniculatum* and *Trema orientalis.*

Outside of these areas of tall forest, to the north and east of Macomia are woodlands characterized by *Albizia versicolor, Amblygonocarpus andongensis, Pouteria alnifolia, Berlinia orientalis, Brachystegia spiciformis, Erythrina haerdii, E. sacleuxii, Julbernardia globiflora, Millettia bussei, M. usaramensis, Mimusops obtusifolia, Pterocarpus angolensis* and *Zanha africana*. On lower-lying drainage lines *Acacia* spp. are common (*A. polyacantha* subsp. *campylacantha, A. nilotica* subsp. *kraussiana, A. seyal* var. *fistula, A. brevispica* subsp. *brevispica, A. hockii), Albizia harveyi, A. petersiana, Cladostemon kirkii, Combretum microphyllum, Dichrostachys cinerea* subsp. *africana* var. *lugardii, Diospyros loureiriana* subsp. *loureiriana, Kigelia africana, Thespesia mossambicensis,* and *Xeroderris stuhlmannii.*

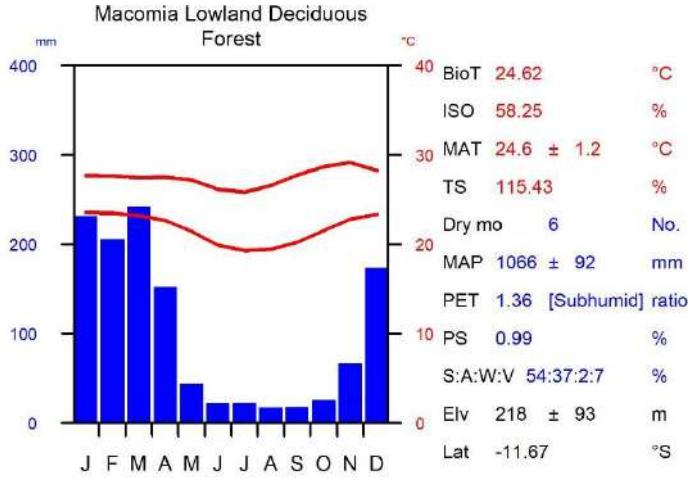
Other associated trees and woody shrubs recorded from this vegetation type include, alphabetically, *Allophylus rubifolius, Bauhinia tomentosa, Boscia salicifolia, Bosqueiopsis carvalhoana, Cadaba kirkii, Cassipourea mossambicensis, Cleistochlamys kirkii, Commiphora pteleifolia, Dalbergia boehmii, D. bracteolata, D.* sp. B of Burrows *et al.* (2018), *Deinbollia borbonica, Dichapetalum aureonitens, D. stuhlmannii, Dombeya acutangula, Elaeodendron schlechterianum, Flacourtia indica, Grewia conocarpa, G. forbesii, Heinsia mozambicensis, Hexalobus mossambicensis, Maerua acuminata, M. andradae, Millettia makondensis, Mimosa busseana, Monanthotaxis buchananii, Monodora grandidieri, Ochna kirkii, Olax dissitiflora, O. pentandra, Philenoptera bussei, Reissantia buchananii, Ritchiea capparoides* var. *capparoides, Rothmannia macrosiphon, Rourea orientalis, Sphaerocoryne gracilis, Swartzia madagascariensis, Tabernaemontana elegans, Tetracera boiviniana, Turraea robusta,* and *Vitex ferruginea.*

Soft shrubs and herbaceous species recorded are *Anchomanes abbreviata, Canavalia africana, Cissus bathyrhakodes, Clitoria ternatea, Commelina zambesiaca, Eriospermum kirkii, Gonatopus clavatus, Gossypioides kirkii, Justicia fittonioides, Stylochaeton natalense, Syncolostemon bracteosa* and *Tephrosia villosa subsp. ehrenbergiana.*

Abiotic environment and climate

Altitude range of 47 to 491 m asl with a mean of 218 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 63.4% while the similarly measured clay content is 22.4%. Soil pH is 6.0.

Precipitation during driest quarter is 17.7 mm.



Species of Conservation Importance

Endemic Plant Species

Bosqueiopsis carvalhoana [NE], *Heinsia mozambicensis* [E].

Threatened Plant Species

Erythrina haerdii [VU*], *Erythrina sacleuxii* [NT], *Hexalobus mossambicensis* [VU], *Hildegardia migoedii* [EN], *Mickelthwaitia carvaloi* [VU], *Millettia makondensis* [VU], *Rothmannia macrosiphon* [VU], *Tannodia swynnertonii* [VU].

Biogeographic Anomalies

In addition to the above, the following are of biogeographic significance: *Anchomanes abbreviata, Antiaris toxicaria subsp. welwitschii var. usambarensis, Justicia fittonioides, Maerua acuminata, Maerua andradae, and Mimosa busseana.*

Photographic credits *top*: E*rythrina sacleuxii* in forest north of Macomia, Cabo Delgado Province. *photo*: J. Burrows; *bottom left*: *Anchomanes abbreviata* in forest, north of Macomia, Cabo Delgado Province. *photo:* M. Lotter; *bottom right*: road between Macomia and Diaca, Cabo Delgado Province; *photo:* M. Lotter.

RLE Assessment

Assessment Summary	Assessment Information
This ecosystem has a restricted geographic distribution but there is little evidence of ongoing declines in extent. However, moderate degradation levels are present across almost the entire distribution of the ecosystem. **Vulnerable**	**Criterion A:** Expansion of urban areas, agriculture & deforestation has caused a 19.98% decline since 1750. Least Concern **Criterion B:** This ecosystem has an AOO of 76 10 x 10 km grid cells and an EOO of 8754.64 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern **Criterion C:** Not evaluated **Criterion D:** Degradation assessment shows that 24.95% of the current distribution faces >90 percent degradation severity, 57.32% of the distribution faces >70 percent degradation severity, and 98.62% of the distribution faces >50 percent degradation severity. Vulnerable **Criterion E:** Not evaluated

MEMBA DRY DECIDUOUS LOWLAND FOREST

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Floresta seca das terras baixas de Memba

Biome Tropical-subtropical forests (T1)

Functional group Tropical-subtropical dry forests and thickets (T1.2)

Regional Ecosystem East African Dry Coastal Forest

Description

Dry deciduous lowland forest, with closed, thick, and impenetrable layer of deciduous to semi-deciduous shrubs. Occurring in lowland areas with high rainfall during summer months and a long dry winter period.

Distribution

Confined to Moambique, from the Lurio River southwards to Quinga. Occurring in Nampula Province.

Characteristic native biota

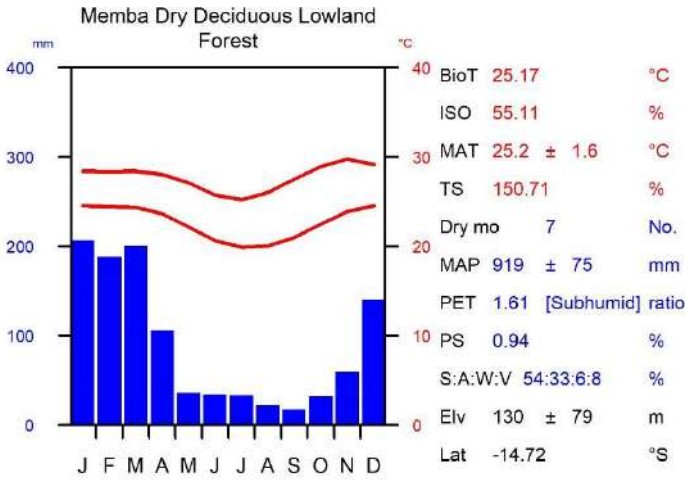
A very poorly known forest unit discernible from satellite imagery and referred to by Wild & Barbosa (1967). The following species have been recorded here*: Adansonia digitata, Afzelia quanzensis, Albizia versicolor, Bombax rhodognaphalon, Ficus* spp., *Dalbergia boehmii, Dialium holtzii, Cordyla africana, Milicia excelsa, Millettia bussei, M. stuhlmannii, Piliostigma thonningii Pteleopsis myrtifolia,* and *Sterculia appendiculata.*

The dense small tree and shrub layer includes *Baphia massaiensis, subsp. gomesii, Buchnerodendron lasiocalyx, Combretum andradae, Friesodielsia obovata, Hugonia busseana, Markhamia obtusifolia,* and *Millettia usambarensis.*

Abiotic environment and climate

Altitude range of 26 to 330 m asl with a mean of 130 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 61.3% while the similarly measured clay content is 24.4%. Soil pH is 6.1.

Precipitation during driest quarter is 25.5 mm.



Species of Conservation Importance: none recorded.

RLE Assessment

Assessment Summary	Assessment Information
This ecosystem has a restricted geographic distribution but there is little evidence of ongoing declines in extent. However, moderate degradation levels are present across almost the entire distribution of the ecosystem. **Vulnerable**	**Criterion A:** Expansion of urban areas, agriculture & deforestation has caused a 27.19% decline since 1750. Least Concern **Criterion B:** This ecosystem has an AOO of 51 10 x 10 km grid cells and an EOO of 7826.45 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern **Criterion C:** Not evaluated **Criterion D:** Degradation assessment shows that 46.04% of the current distribution faces >90 percent degradation severity, 77.96% of the distribution faces >70 percent degradation severity, and 93.24% of the distribution faces >50 percent degradation severity. Vulnerable **Criterion E:** Not evaluated

MUEDA MIDSLOPE DECIDUOUS FOREST

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Floresta decidua de média altitude de Mueda
Biome Tropical-subtropical forests (T1)
Functional group Tropical-subtropical dry forests and thickets (T1.2)
Regional Ecosystem East African Dry Coastal Forest

Description

A forest type that was heavily harvested in the past with remnants comprised of medium to tall closed deciduous forest.

Distribution

Mostly confined to Mozambiue, on the east facing slopes of the Mueda plateau, as far south as Bilibiza. Occurring in Cabo Delgado Province.

Characteristic native biota

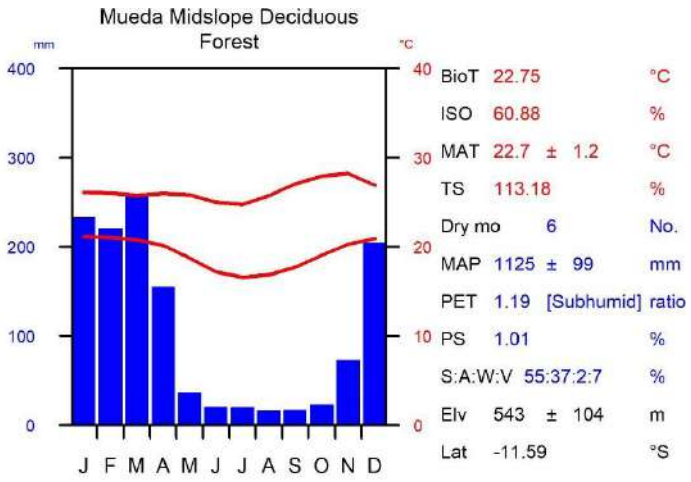
Acacia polyacantha subsp. *campylacantha, Adansonia digitata, Afzelia quanzensis, Albizia adianthifolia, Bombax rhodognaphalon, Cladostemon kirkii, Cordyla africana, Dialium holtzii, Dombeya shupangae, Ficus* spp., *Kigelia africana, Milicia excelsa, Millettia bussei, M. stuhlmannii, Parinari curatellifolia, Parkia filicoidea, Pteleopsis myrtifolia, Sterculia appendiculata, Synsepalum brevipes, Tabernaemontana elegans* and *Trema orientalis.*

Small trees, shrubs and lianes include *Acacia schweinfurthii, Artabotrys monteiroae, Capparis erythrocarpos, C. tomentosa, C. viminea* var. *orthacantha, Combretum paniculatum, Dielsiothamnus divaricatus, Englerophytum magalismontanum, Gossypioides kirkii, Grewia micrantha, Mallotus oppositifolia, Mezoneuron angolensis, Monanthotaxis trichocarpa, Premna* spp., *Reissantia buchananii, Rinorea ferruginea, Strychnos* spp., *Turraea robusta, Uvaria acuminata, Vangueria infausta* and *Ximenia caffra.*

Abiotic environment and climate

Altitude range of 281 to 700 m asl with a mean of 543 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 52.2% while the similarly measured clay content is 28.1%. Soil pH is 6.0.

Precipitation during driest quarter is 13.9 mm.



Species of Conservation Importance

Endemic Plant Species

Capparis viminea var. *orthacantha* [NE].

Photographic credits eastern slope of Mueda plateau, on road between Muidumbe and Miengueliua, Cabo Delgado Province, with *Dielsiothamnus divaricatus* in foreground. photo: M. Lotter.

RLE Assessment

Assessment Summary

This ecosystem has faced significant historical declines, has a very restricted geographic distribution with evidence of continuing ongoing declines, and faces widespread degradation. **Endangered**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 76.78% decline since 1750. Endangered

Criterion B: This ecosystem has an AOO of 31 10 x 10 km grid cells and an EOO of 3576.16 km2. It has undergone substantial historical decline, and there is evidence that deforestation & other threats are leading to continuing decline. Endangered

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 76.3% of the current distribution faces >90 percent degradation severity, 95.67% of the distribution faces >70 percent degradation severity, and 97.77% of the distribution faces >50 percent degradation severity. Endangered

Criterion E: Not evaluated

MUEDA PLATEAU MOIST FOREST

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Floresta húmida do planalto de Mueda
Biome Tropical-subtropical forests (T1)
Functional group Tropical-subtropical dry forests and thickets (T1.2)
Regional Ecosystem East African Dry Coastal Forest

Description

Moist semi-deciduous forests but now a highly transformed vegetation type due to intensive logging and subsequent rural settlement, much changed from the time of Pedro & Barbosa (1955), with the forested areas now only evident as remnant forest indicator species that persist today, such as *Harungana madagascariensis, Erythrophleum suaveolens, Rinorea ferruginea* and patches of bracken (*Pteridium aquilinum*) and *Aframomum* that indicate moist environments and which often colonize areas previously occupied by forest. Occurring above 700 m.

Distribution

Confined to the summit of the Mueda Plateau, Cabo Delgado Province.

Characteristic native biota

Pedro & Barbosa (1955) record medium-sized forests or tall evergreen forest composed of *Albizia gummifera, Anthocleista grandiflora, Aframomum* sp., *Bersama abyssinica* var. *nyassae, Dichapetalum* spp., *Dracaena mannii, Ekebergia capensis, Erythrophleum suaveolens, Keetia venosa, Macaranga capensis, Mystroxylon aethiopicum* subsp. *schlechteri, Paropsia grewioides, Pteleopsis myrtifolia, Searsia longipes, Synaptolepis* (*oliveriana*?), *Synsepalum brevipes, Syzygium guineense, Rhaphiostylis beninensis, Salacia madagascariensis, Setaria megaphylla, Trema orientalis, Trichilia emetica, Xylopia aethiopica,* and *X. arenaria.*

Remnant forest elements recorded are *Harungana madagascariensis, Erythrophleum suaveolens, Rinorea ferruginea, Casearia gladiiformis, Dracaena mannii* and patches of bracken (*Pteridium aquilinum*) and *Aframomum* spp.. *Newtonia buchananii* is absent from this unit.

The existing recorded large trees are *Albizia adianthifolia, A. versicolor, Amblygonocarpus andongensis, Cordyla africana, Dialium holtzii, Ekebergia capensis, Erythrophleum suaveolens, Millettia stuhlmannii, Parinari curatellifolia, Pterocarpus angolensis,* and *Sterculia schliebenii.*

Small to medium trees recorded are *Annona senegalensis, Baphia macrocalyx, Cassia angolensis, Cladostemon kirkii, Combretum collinum, C. xanthothyrsum, Commiphora fulvotomentosa, Dalbergia boehmii, D. fischeri, D. melanoxylon, Dovyalis hispidula, Flacourtia indica, Maerua angolensis, Millettia eetveldeana, M. usaramensis, Ochna kirkii, Paropsia grewioides, Senna petersiana, Steganotaenia araliacea, Swartzia madagascariensis, Tetracera boiviniana, Turraea robusta* and *Xylia africana.*

Shrubby species include *Acacia latistipulata, Capparis tomentosa, Coptosperma* sp., *Cuviera schliebenii, C. tomentosa, Dichapetalum barbosae, D. edule, D. deflexum, Diospyros loureiriana* subsp. *rufescens, Flacourtia vogelii, Grevea eggelingii* var. *echinocarpa, Grewia leptopus, Jeffreycia zanzibarensis, Leptactina delagoensis, Maerua acuminata, Monanthotaxis buchananii, Monodora minor, Psychotria mahonii, Ritchiea capparoides, Rourea boiviniana, Rutidea fuscescens subsp. fuscescens, Tricalysia pallens, T. semidecidua, Vismia punctata, Xylopia carolinae* and *X. collina.*

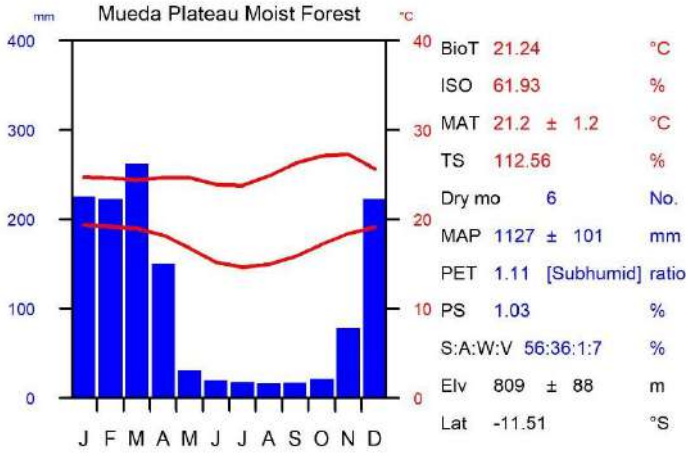
Climbers and lianes recorded are *Agelaea pentagyna, Ancylobotrys tayloris, Artabotrys monteiroae, Asparagus setaceus, Capparis erythrocarpos, Dalbergia sp.* B of Burrows et al. (2018), *Dioscorea dumetorum, Ipomoea wightii, Keetia gueinzii, Leptaulus* sp., *Luffa aegyptiaca, Mucuna coriacea, Salacia orientalis, Secamone parvifolia, Stephania abyssinica, Strophanthus petersianus, Tiliacora funifera* and *Tylophora anomala.*

A patch of swamp forest on the western edge of the plateau (the source of water for the town of Mueda) is dominated by *Voacanga thouarsii, Synsepalum brevipes, Syzygium owariensis, Albizia adianthifolia,* and the climbing swamp fern, *Stenochlaena tenuifolia*, with *Tarenna pavettoides* subsp. *gillmanii* and *Blotiella natalensis* recorded in the understorey.

Abiotic environment and climate

Altitude range of 600 to 990 m asl with a mean of 809 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 51.9% while the similarly measured clay content is 28.5%. Soil pH is 6.0.

Precipitation during driest quarter is 11 mm.



Species of Conservation Importance

Endemic Plant Species

Celosia patentiloba [NE*], *Monodora carolinae* [NE].

Threatened Plant Species

Acacia latistipulata [VU], *Baphia macrocalyx* [VU], *Celosia patentiloba* [CR*], *Cuviera tomentosa* [EN*], *Grevea eggelingii* var. *echinocarpa* [EN], *Monodora carolinae* [EN], *Paropsia grewioides* var. *orientalis* [EN*], *Salacia orientalis* [VU], *Sterculia schliebenii* [VU].

Biogeographic Anomalies

Ancylobotrys tayloris, Cassia angolensis, Flacourtia vogelii, Jeffreycia (*Vernonia*) *zanzibarensis.*

Photographic credits *top*: western edge of Mueda Plateau, Cabo Delgado Province. photo: M. Lotter; *bottom*: interior of swamp forest on western edge of Mueda Plateau, Cabo Delgado Province. photos: M. Lotter.

RLE Assessment

Assessment Summary	Assessment Information
This ecosystem has faced significant historical declines, and has an extremely restricted geographic distribution with evidence of continuing ongoing declines. **Critically Endangered**	**Criterion A:** Expansion of urban areas, agriculture & deforestation has caused an 88.37% decline since 1750. Endangered **Criterion B:** This ecosystem has an AOO of 15 10 x 10 km grid cells and an EOO of 1477.3 km2. It has undergone substantial historical decline, and there is evidence that deforestation & other threats are leading to continuing decline. Critically Endangered **Criterion C:** Not evaluated **Criterion D:** Degradation assessment shows that 76.5% of the current distribution faces >90 percent degradation severity, 95.95% of the distribution faces >70 percent degradation severity, and 98.3% of the distribution faces >50 percent degradation severity. Endangered **Criterion E:** Not evaluated

NAMPULA IRONWOOD FOREST

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Floresta de mecrusse de Nampula

Biome Tropical-subtropical forests (T1)

Functional group Tropical-subtropical dry forests and thickets (T1.2)

Regional Ecosystem East African Dry Coastal Forest

Description

Medium–sized dense *Androstachys* forest that is found in patches on deep sands in coastal Nampula Province. Species diversity is considerably higher than that of the Southern Ironwood Dry Forest.

Distribution

This forest type is only known from two large patches south and south-west of Nacala in Nampula Province. Reserva Florestal de Matibane (also known as Reserva de Crusse or Floresta de Mecrusse) is perhaps the best example of this forest type. The other poorly known forest occurs on Serra de Messa to the west.

Characteristic native biota

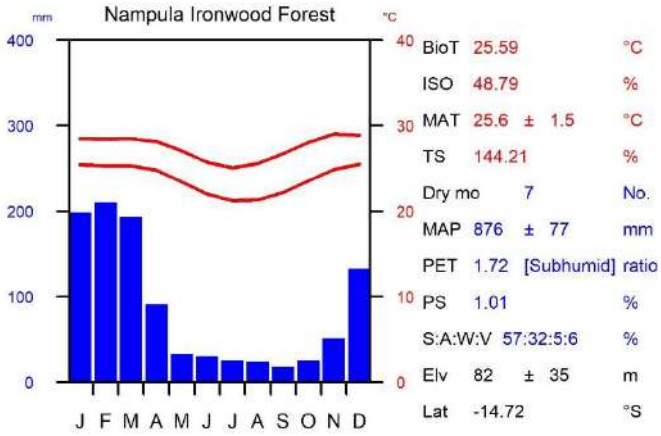
Androstachys johnsonii is the dominant canopy tree, but the canopy may also contain several other species, such as the iconic *Icuria dunensis*. The extent and composition of this forest is still relatively poorly known with the canopy comprising *Androstachys johnsonii* (also becoming emergent), *Afzelia quanzensis, Nesogordonia holtzii, Vitex carvalhi, Zanthoxylum holtzianum* and, in places, *Icuria dunensis* forming almost pure stands. The understorey is diverse although sometimes dominated by *Androstachys* saplings; also *Alchornea laxiflora, Artabotrys brachypetalus*, *Caloncoba 91 elwitschia, Carissa macrocarpa, Commiphora serrata, Hexalobus mossambicensis*, *Hyperacanthus microphyllus, Mostuea microphylla, Pavetta dianeae, Premna tanganyikensis, Pseudoprosopis euryphylla, Psydrax micans, Rinorea ilicifolia, Schlechterina mitostemmatoides, Sclerochiton coeruleus, Sphaerocoryne gracilis, Strychnos myrtoides, S. panganensis, Synaptolepis oliveriana, Uvaria lucida* subsp. *Virens* and *Warneckea sousae*. Three members of the Commelinaceae have been recorded in the forest: *Aneilema dregeana, Commelina bracteosa* and *C. forskaolii*. The herbaceous layer includes *Adiantum mendoncae, Cyperus maranguensis* and *Cyperus pseudopulchellus.*

Disturbed areas are invaded by *Acacia adenocalyx* and *Dichrostachys cinerea*. *Indigofera fulgens* occurs on the forest margins.

Abiotic environment and climate

Altitude range of 53 to 275 m asl with a mean of 82 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 58.3% while the similarly measured clay content is 25%. Soil pH is 5.5.

Precipitation during driest quarter is 27.9 mm.



Species of Conservation Importance

Endemic Plant Species

Hexalobus mossambicensis [VU], *Icuria dunensis* [NE], *Pavetta dianeae* [NE], *Vitex carvalhi* [NE].

Threatened Plant Species

Adiantum mendoncae [NT], *Agelanthus longipes* [VU], *Hexalobus mossambicensis* [VU], *Icuria dunensis* [EN], *Pavetta dianeae* [EN], *Premna tanganyikensis* [VU], *Psydrax micans* [VU], *Vitex carvalhi* [VU], *Warneckea sousae* [NT], *Zanthoxylum holtzianum* [VU], *Zanthoxylum tenuipedicellatum* [EN].

Biogeographic Anomalies

Rare records include *Burttia prunoides* (specimen needs confirmation) and *Nesogordonia holtzii,* and *Androstachys johnstonii* where the next closest population is south of the Zambezi River.

Photographic credits *left*: dense *Androstachys* forest, Reserva Florestal de Matibane; *centre*: a patch of *Icuria dunensis* within the Ironwood forest, Reserva Florestal de Matibane, Nacala; *right*: interior of the Reserva Florestal de Matibane, Nampula Province. All photos: J. Burrows.

RLE Assessment

Assessment Summary

This ecosystem has a restricted geographic distribution but there is little evidence of ongoing declines in extent. However, moderate to high degradation levels are present across almost the entire distribution of the ecosystem. **Vulnerable**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 2.41% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 3 10 x 10 km grid cells and an EOO of 90 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 9.34% of the current distribution faces >90 percent degradation severity, 81.43% of the distribution faces >70 percent degradation severity, and 99.79% of the distribution faces >50 percent degradation severity. Vulnerable

Criterion E: Not evaluated

NANGADE DECIDUOUS NEWTONIA FOREST

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Floresta seca de Newtonia de Nangade

Biome Tropical-subtropical forests (T1)

Functional group Tropical-subtropical dry forests and thickets (T1.2)

Regional Ecosystem East African Dry Coastal Forest

Description

Tall semi-deciduous forest with the large eponymous *Newtonia paucijuga* defining this forest type, although rather scattered throughout. Its immense protective shadow provides a habitat for numerous smaller species, many of considerable phytogeographical significance.

Distribution

Only known from around the town of Nangade in Mozambique, close to the border with Tanzania. It is not known whether it crosses into adjacent Tanzania. Occurring in Cabo Delgado Province.

Characteristic native biota

The main trees are *Acacia hockii, A. latistipulata, A. polyacantha* subsp. *campylacantha, A. sieberiana* var. *sieberiana, Afzelia quanzensis, Albizia adianthifolia, A. amara, A. brevifolia, A. isenbergiana, A. versicolor, Amblygonocarpus andongensis, Brachystegia spiciformis, Bombax rhodognaphalon, Cassipourea mossambicensis, Dalbergia nitidula, Erythrina livingstoniana, Guibourtia schliebenii, Hymenaea verrucosa, Manilkara discolor, M. sansibarensis, Millettia stuhlmannii, M. usaramensis, Newtonia paucijuga, Parinari curatellifolia, Philenoptera bussei, Pseudolachnostylis maprouneifolia, Pteleopsis myrtifolia, Pterocarpus angolensis, Schrebera trichoclada, Scorodophloeus fischeri, Sterculia schliebenii, Swartzia madagascariensis, Tetracera boiviniana, Vitex payos* var. *payos,* and *Xeroderris stuhlmannii.*

Small trees and woody shrubs are numerous: *Annona senegalensis, Capparis tomentosa, Carpolobia goetzei, Carvalhoa campanulata, Cassia afrofistula* var. *afrofistula, Combretum stocksii, Croton scheffleri, C. longipedicellatus* subsp. *austrotanzanica, Dalbergia melanoxylon, Deinbollia borbonica, Dichapetalum barbosae, D. edule, D. macrocarpum, Dichrostachys cinerea* subsp. *forbesii, Diospyros verrucosa, Gymnanthemum amygdalinum, Lagynias* cf. *rufescens, Maerua acuminata, M. aethiopica, M. bussei, Mallotus oppositifolius, Monanthotaxis buchananii, M. trichantha, M. trichocarpa, Monodora junodii* var. *macrantha, Mostuea brunonis, Ochna kirkii, O. mossambicensis, Olax pentandra, Oxyanthus latifolius, Paropsia braunii, Plesiatropha carpinifolia* var. *strigosa, Psydrax micans, Rinorea ilicifolia, R. welwitschii* subsp. *tanzanica, Ritchiea pygmaea, Rourea coccinea* subsp. *boiviniana, R. orientalis, Rothmannia macrosiphon, Sphaerocoryne gracilis, Streblus usambarensis, Uvaria acuminata, U. rovumae, Vangueria randii* subsp. *vollesenii, Vismia pauciflora, Vismianthus punctatus, Vitex franceseana, Warneckea sansibarensis, W. sousae, Whitfieldia orientalis, Ximenia caffra*, and *Xylopia collina.*

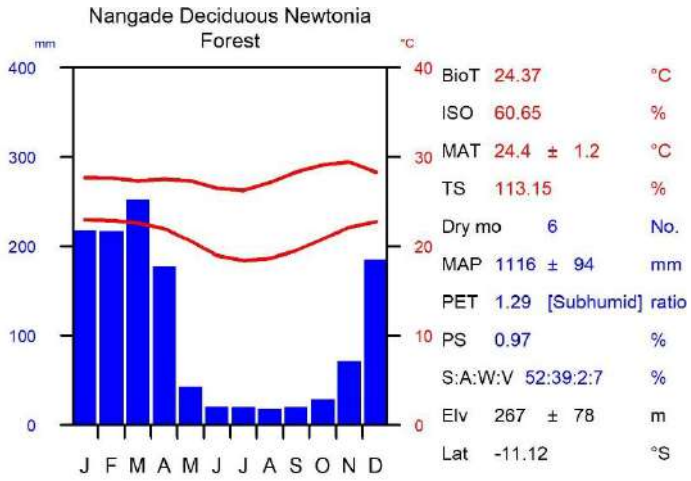
Climbers and lianes are numerous and include *Ancylobotrys petersianus, Apodostigma pallens, Baissea myrtifolia, Bonamia mossambicensis, Combretum illairii, Entada stuhlmannii, Jasminum stenolobum, Landolphia parviflora, Millettia impressa* subsp. *goetzeana, Platysepalum inopinatum*, and *Pseudoprosopis euryphylla.*

Herbaceous species and grasses are poorly collected and the only species recorded are *Commelina benghalensis, Gilgiochloa indurata* (grass), and *Stylochaeton puberulum.*

Abiotic environment and climate

Altitude range of 165 to 470 m asl with a mean of 267 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 65.2% while the similarly measured clay content is 20.0%. Soil pH is 5.9.

Precipitation during driest quarter is 18.8 mm.



Species of Conservation Importance

Endemic Plant Species

Maerua acuminata [E], *Uvaria rovumae* [E*], *Vangueria randii* subsp. *vollesenii* [NE], *Vitex franceseana* [E].

Threatened Plant Species

Rothmannia macrosiphon [VU], *Sterculia schliebenii* [VU], *Uvaria rovumae* [CR*], *Vangueria randii* subsp. *vollesenii* [VU], *Vismia pauciflora* [EN].

Biogeographic Anomalies

Other species that are known only in Mozambique from this vegetation type, or from this border area of northern Cabo Delgado are *Albizia isenbergiana, Combretum stocksii, Croton scheffleri, C. longipedicellatus* subsp. *austrotanzanicus, Gilgiochloa indurata, Lagynias* cf. *rufescens, Millettia bussei, M. impressa* subsp. *goetzeana, Newtonia paucijuga, Rinorea welwitschii* subsp. *tanzanica, Rothmannia macrosiphon, Streblus usambarensis,*

Scorodophloeus fischeri, Vangueria randii subsp. *vollesenii, Vismia pauciflora, Vismianthus punctatus*, and *Whitfieldia orientalis*. *Maerua acuminata* and *Vitex franceseana* are endemic to the Rovuma Centre of Endemism.

Photographic credits *left & right*: *Newtonia paucijuga*, east of Nangade, Cabo Delgado Province. photos: M. Lotter.

RLE Assessment

Assessment Summary	Assessment Information
This ecosystem has faced significant historical declines, and has an extremely restricted geographic distribution with evidence of continuing ongoing declines. **Critically Endangered**	**Criterion A:** Expansion of urban areas, agriculture & deforestation has caused a 46.33% decline since 1750. Least Concern **Criterion B:** This ecosystem has an AOO of 14 10 x 10 km grid cells and an EOO of 752.24 km2. It has undergone substantial historical decline, and there is evidence that deforestation & other threats are leading to continuing decline. Critically Endangered **Criterion C:** Not evaluated **Criterion D:** Degradation assessment shows that 58.97% of the current distribution faces >90 percent degradation severity, 92.35% of the distribution faces >70 percent degradation severity, and 94.81% of the distribution faces >50 percent degradation severity. Endangered **Criterion E:** Not evaluated

NORTHERN INSELBERG FOREST

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Florestas de Inselberg das terras baixas do Norte

Biome Tropical-subtropical forests (T1)

Functional group Tropical-subtropical dry forests and thickets (T1.2)

Regional Ecosystem East African Dry Coastal Forest

Description

Tall semi-deciduous forest in gulley's between the inselberg hills or around the base of rocky outcrops, where considerable water run-off supports a moist forest.

Distribution

Full extent not known anticipated to be largely limited to northern Mozambique, and currently mapped between Ancuabe and Niassa Special Reserve. Occurring in Cabo Delgado Province.

Characteristic native biota

Composed of a combination of some of the following canopy trees, depending upon latitude, inselberg size, rainfall, aspect, position, etc: *Adansonia digitata, Afzelia quanzensis, Albizia glaberrima, A. gummifera, A. versicolor, Antiaris toxicaria, Berchemia discolor, Blighia unijugata, Bombax rhodognaphalon, Burttdavya nyasica, Cordyla africana, Diospyros natalensis, Erythrophleum suaveolens, Ficus bubu, F. bussei, F. sycomorus* subsp. *sycomorus, Hirtella zanzibarica, Lecaniodiscus fraxinifolius, Margaritaria discoidea* subsp. *fagifolia, Mascarenhasia arborescens, Milicia excelsa, Millettia stuhlmannii, Pachystela brevipes, Parkia filicoidea, Pouteria pseudoracemosa, Ricinodendron heudelotii, Schrebera trichoclada, Sorindeia madagascariensis, Sterculia appendiculata, Synsepalum cerasiferum, Terminalia sambesiaca,* and *Vitex doniana.* Climbers and lianes include *Dalbergia arbutifolia, D. bracteolata, D. fischeri, Gouania longispicata, Mezoneuron angolense, Mussaenda arcuata, Oncinotis tenuiloba, Saba comorensis*, and *Strophanthus courmontii.*

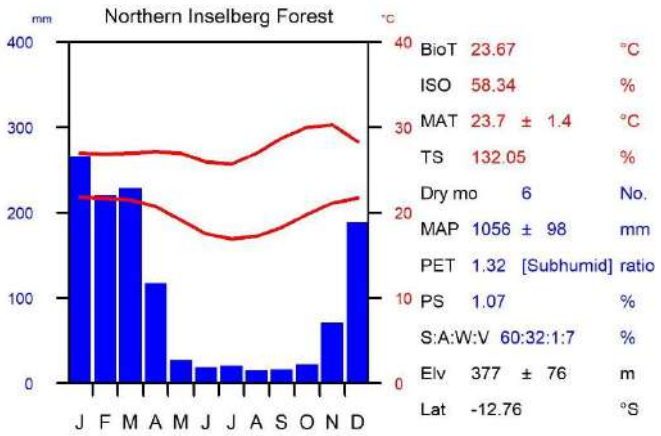
Understorey trees and shrubs include *Alchornea laxiflora, Bosqueiopsis carvalhoana, Carvalhoa campanulata, Cavacoa aurea, Coffea zanguebariae, Cola greenwayi, Craterispermum schweinfurthii, Croton megalocarpoides, Dracaena mannii, Drypetes natalensis, Garcinia buchananii, Harungana madagascariensis, Lasiodiscus pervillei, Monodora junodii* var. *junodii, Polysphaeria lanceolata, Psychotria capensis* subsp. *capensis, Rinorea arborea, R. elliptica, Rothmannia manganjae, Sclerochiton kirkii, Suregada zanzibarensis,* and *Tarenna pavettoides* subsp. *affinis*, among others.

The seasonal rivers draining off the inselbergs are fringed with *Berchemia discolor, Diospyros mespiliformis, Ficus sansibarica* subsp. *sansibarica, F. sycomorus* subsp. *sycomorus, F. bussei, Garcinia livingstonei, Kigelia africana, Philenoptera violacea, Tamarindus indica, Terminalia sambesiaca* and *Trichilia emetica*. Associated smaller trees and shrubs include *Bauhinia petersiana, Cladostemon kirkii, Cleistochlamys kirkii, Commiphora serrata, Diospyros verrucosa, Dovyalis hispidula, Harrisonia abyssinica, Hugonia busseana, Maclura africana, Markhamia sansibarica, Millettia usaramensis, Monodora* cf. *grandidieri, M. junodii* subsp. *junodii, Vitex payos* var. *payos* and *Xylotheca tettensis*. Along the lower and drier base of the inselbergs is a mixed miombo woodland of *Brachystegia spiciformis* mixed with *Afzelia quanzensis*, *Baphia massaiensis* subsp. *gomesii, Dracaena reflexa, Holarrhena pubescens, Julbernardia globiflora* and *Tabernaemontana elegans.*

Abiotic environment and climate

Altitude range of 300 to 600 m asl with a mean of 377 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 58.2% while the similarly measured clay content is 25.8%. Soil pH is 5.8.

Precipitation during driest quarter is 14.1 mm.



Species of Conservation Importance

Threatened Plant Species

Coffea zanguebariae [VU], *Pouteria pseudoracemosa* [VU].

Biogeographic Anomalies

Pouteria pseudoracemosa is known in Mozambique only from a single locality within this forest type.

Photographic credits *top left & right*: forest interior scenes, Taratibu, Ancuabe District, Cabo Delgado; *bottom*: forest grading into miombo woodland at the base of an inselberg, Taratibu, Cabo Delgado Province. all photos: J. Burrows.

RLE Assessment

Assessment Summary	Assessment Information
This ecosystem has a restricted geographic distribution but there is little evidence of ongoing declines in extent. However, moderate degradation levels are present across almost the entire distribution of the ecosystem. **Vulnerable**	**Criterion A:** Expansion of urban areas, agriculture & deforestation has caused a 1.1% decline since 1750. Least Concern **Criterion B:** This ecosystem has an AOO of 1 10 x 10 km grid cells and an EOO of 1798.15 km2. Despite having a very restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern **Criterion C:** Not evaluated **Criterion D:** Degradation assessment shows that 0% of the current distribution faces >90 percent degradation severity, 0% of the distribution faces >70 percent degradation severity, and 92.46% of the distribution faces >50 percent degradation severity. Vulnerable **Criterion E:** Not evaluated

ROVUMA BASIN COASTAL FOREST

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Floresta Costeira da Bacia do Rovuma
Biome Tropical-subtropical forests (T1)
Functional group Tropical-subtropical dry forests and thickets (T1.2)
Regional Ecosystem East African Dry Coastal Forest

Description

An extremely species-rich forest type composed of seasonally dry forest and areas of thicket, interspersed with patches of woodland. This forest type extends as pockets of forest, often on ancient termite mounds, into Rovuma Coastal Moist Miombo and Coastal Berlinia Miombo.

Distribution

Extending from the moist lowland areas of the Rovuma River southwards as far as Pangane. Occurring in Cabo Delgado Province.

Characteristic native biota

Miombo elements are sparse, with scattered *Brachystegia spiciformis* and *Julbernardia globiflora*. The main trees are (alphabetically): *Afzelia quanzensis, Albizia adianthifolia, A. forbesii, A. isenbergiana, A. petersiana* subsp. *petersiana, A. versicolor, Amblygonocarpus andongensis, Baphia macrocalyx, Bivinia jalbertii, Brackenridgea zanguebarica, Cleistanthus schlechteri, Commiphora serrata, Dialium holtzii, Diospyros abyssinica* subsp. *abyssinica, D. natalensis, Erythrina sacleuxii, Erythrophleum suaveolens, Guibourtia schliebenii, Hirtella zanzibarica, Hymenaea verrucosa, Lannea antiscorbutica, Manilkara discolor, M. sansibarensis, Mickelthwaitia carvalhoi, Millettia stuhlmannii, Newtonia paucijuga, Phoenix reclinata, Pteleopsis myrtifolia, Pterocarpus angolensis Tamarindus indica, Trema orientalis, Vitex carvalhi, V. mossambicensis* and *Zanthoxylum leprieurii.* Scattered *Acacia* species are represented by *Acacia brevispica* subsp. *brevispica, A. quiterajoensis, A. robusta* subsp. *usambarensis* and *A. senegal* var. *leiorhachis*.

Smaller trees are *Annona senegalensis, Antidesma venosum, Cassipourea mossambicensis, Drypetes arguta, D. sclerophylla, Haplocoelum inopleum, Millettia usaramensis, Mundulea sericea, Ormocarpum sennoides, Ozoroa insignis* subsp. *reticulata, Rotheca myricoides* subsp. *myricoides* var. *discolor, Swartzia madagascariensis, Tetracera boiviniana, and Vangueria infausta.*

The thicket and forest understorey component is dominated particularly by the families Annonaceae (*Artabotrys brachypetalus, Dielsiothamnus divaricatus, Monanthotaxis buchananii, M. discolor, M. triacanthus, M. trichocarpa, Monodora carolinae, M. junodii* var. *junodii, M. junodii* var. *macrantha, M. minor, Sphaerocoryne gracilis, Uvaria acuminata, U. kirkii, U. leptocladon, U. lucida* subsp. *lucida, Xylopia lukei, X. tenuipetiolata*), Capparaceae (*Boscia angustifolia* var. *corymbosa, Capparis erythrocarpos,*

Cladostemon kirkii, Cleistochlamys kirkii, Maerua acuminata, M. bussei, M. kirkii, M. triphylla var. *pubescens, Ritchiea capparoides* subsp. *capparoides*), Memecylaceae (*Memecylon aenigmaticum, M. rovumense, M. torrei, Warneckea albiflora, W. cordiformis, W. sansibarica* subsp. *sansibarica, W. sousae*) and especially Rubiaceae (*Bullockia mombazensis, Chassalia colorata, C. umbraticola, Chazaliella abrupta, Cladoceras rovumense* (= *Tarenna* sp. 53 of Degreef, 2006), *Coptosperma littorale, C. nigrescens, Cremaspora triflora* subsp. *confluens, Cuviera semseii, Empogona* sp. B. of FZ, *Heinsia zanzibarica, Hymenodictyon parvifolium* subsp. *parvifolium, Leptactina delagoensis* subsp. *delagoensis, L. papyrophloea, Oxyanthus latifolius, O. strigosus, O. zanguebaricus, Pavetta decumbens, P. lindina, P. uniflora, Psychotria capensis* subsp. *riparia, P. linearisepala* var. *linearisepala, Psydrax kaessneri, P. livida, P. martinii, P. micans, Pyrostria phyllanthoidea, Rytigynia celastroides* var. *celastroides, Tapiphyllum burnettii, Triainolepis africanus* subsp. *hildebrandtii, Tricalysia schliebenii*).

Other important constituents are *Alchornea laxiflora, Allophylus rubifolius, Baphia punctulata* subsp. *palmensis, Buchnerodendron lasiocalyx, Carpodiptera africana, Carpolobia goetzei, Casearia celastroides, Carvalhoa campanulata, Combretum illairii, Croton kilwae, C. pseudopulchellus, Dichapetalum edule, D. macrocarpum, D. mossambicense, Diospyros mafiensis, D. verrucosa, Dovyalis hispidula, Grewia conocarpa, G. holstii, G. limae, Plesiatropha* (*Mildbraedia*) *carpinifolia, Millettia makondensis, Mimosa busseana, Mostuea brunonis, Ochna dolicharthros, O. puberula, O. rovumense, Olax pentandra, Pentarhopalopilia umbellulata, Premna gracillima, P. schliebenii, Pseudoprosopis euryphylla, Rinorea elliptica, R. angustifolia* subsp. *ardisiiflora, Rourea coccinea* subsp. *boiviniana, R. orientalis, Salacia leptoclada, Strychnos myrtoides, S. henningsii, Suregada zanzibarensis, Synaptolepis alternifolia, Synadenium* cf. *grantii, Vepris allenii, V. sansibarensis, V. stolzii, Vismia orientalis, V. pauciflora, Vismianthus punctatus,* and *Vitex franceseana.*

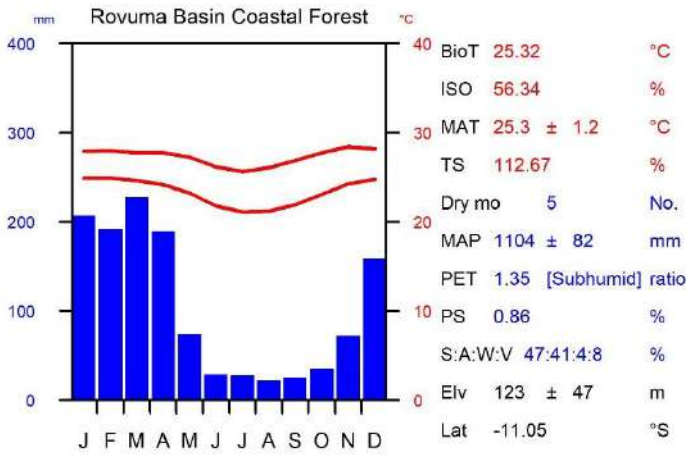
Lianes include *Adenia gummifera, Ancylobotrys taylori, Baissea myrtifolia, Combretum pentagonum, Dalbergia bracteolata, Dalbergia* sp. B of Burrows *et al.* (2018), *Entada chrysostachys, E. stuhlmannii, Millettia impressa, Platysepalum inopinatum, Strophanthus kombe*, and *S. petersianus*. Smaller shrublets and herbaceous species recorded in this type are *Eriosema pauciflorum, Indigofera fulgens, I. schimperi, Solanum richardii, S. tettense, Rhodopentas bussei, Tephrosia noctiflora, Tinnea zambesiaca* and the slender climbers *Ampelocissus obtusata* subsp. *kirkiana, Asparagus petersianus, Ceropegia* cf. *lugardiae, Convolvulus goyderi, Dioscorea cochlearia-apiculata* and *D. sansibarensis.*

Towards the west of the Rovuma Valley occurs a somewhat drier forest on slightly heavier soils, which includes *Acacia adenocalyx, Bosqueiopsis carvalhoana, Carvalhoa campanulata, Cordyla africana, Dialium holtzii, Dombeya acutangula, Erythrina livingstoniana, Fernandoa magnifica, Newtonia paucijuga, Pteleopsis myrtifolia, Rothmannia macrosiphon, Sterculia schliebenii, Terminalia sambesiaca, Vitex carvalhoi* and *Xeroderris stuhlmannii.*

Abiotic environment and climate

Altitude range of 30 to 280 m asl with a mean of 123 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 63.1% while the similarly measured clay content is 21.7%. Soil pH is 5.6.

Precipitation during driest quarter is 32.4 mm.



Species of Conservation Importance

Endemic Plant Species

Casearia celastroides [NE], *Chassalia colorata* [NE], *Clerodendrum lutambense* [NE*], *Combretum lindense* [NE*], *Memecylon rovumense* [NE*], *Oxyanthus strigosus* [NE], *Pyrostria* sp. D of FTEA [NE*], *Warneckea albiflora* [E], *Warneckea cordiformis* [E], *Vitex carvalhi* [NE].

Note on endemic taxa found in this vegetation type and similar ones over the border in Tanzania. A full count is not available but Timberlake *et al.* (2010) suggest 30 Cabo Delgado dry forest endemics (principally this vegetation type) plus a further 43 endemics to Cabo Delgado and adjacent Tanzania. Burrows & Timberlake (2014, unpublished) suggest 225 taxa endemic to Rovuma Centre of Endemism, most of which would be from this vegetation type on both sides of the border.

Threatened Plant Species

Chassalia colorata [EN], *Clerodendrum lutambense* [VU*], *Combretum lindense* [CR*], *Diospyros magogoana* [CR*], *Drypetes sclerophylla* [EN], *Erythrina sacleuxii* [NT], *Grewia limae* [EN], *Leptactina papyrophloea* [EN], *Memecylon aenigmaticum* [EN], *Memecylon rovumense* [EN*], *Memecylon torrei* [EN], *Plesiatropha* (*Mildbraedia*) *carpinifolia* [VU], *Monodora carolinae* [EN], *Omphalea mansfieldiana* [EN*], *Ormocarpum sennoides* subsp. *zanzibaricum* [VU*], *Oxyanthus strigosus* [EN], *Peponium leucanthum* [VU*], *Pyrostria* sp. D of FTEA [EN*], *Vitellariopsis kirkii* [VU*], *Tricalysia schliebenii* [VU], *Vepris allenii* [EN], *Vepris sansibarensis* [VU], *Warneckea albiflora* [CR], *Warneckea cordiformis* [CR], *Vitex carvalhi* [VU], *Xylopia lukei* [EN], *Zanthoxylum holtzianum* var. *holtzianum* [VU].

Biogeographic Anomalies

Acacia quiterajoensis, *Ancylobotrys tayloris*, *Albizia isenbergiana*, *Baissea myrtifolia*, *Bosqueiopsis carvalhoana*, *Bullockia mombazensis*, *Casearia celastroides*, *Chassalia colorata*, *Convolvulus goyderi*, *Cuviera semseii*, *Drypetes sclerophylla*, *Empogona* sp. B. of FZ, *Erythrina sacleuxii*, *Grewia holstii*, *G. limae*, *Leptactina papyrophloea*, *Maerua acuminata*, *M. bussei*, *Memecylon aenigmaticum*, *M. rovumense*, *M. torrei*, *Micklethwaitia carvalhoi*, *Plesiatropha* (*Mildbraedia*) *carpinifolia*, *Millettia makondensis*, *Mimosa busseana*, *Monanthotaxis triacantha*, *Monodora carolinae*, *M. minor*, *Newtonia paucijuga*, *Ochna dolicharthros*, *O. rovumense*, *Ormocarpum sennoides* subsp. *zanzibaricum*, *Oxyanthus strigosus*, *Psydrax kaessneri*, *P. martinii*, *Pyrostria phyllanthoidea*, *Rothmannia macrosiphon*, *Synadenium* cf. *grantii*, *Tapiphyllum burnettii*, *Cladoceras rovumense* (= *Tarenna* sp. 53 of Degreef, 2006), *Triainolepis africanus* subsp. *hildebrandtii*, *Tricalysia schliebenii*, *Vepris allenii*, *V. sansibarensis*, *Warneckea albiflora*, *W. cordiformis*, *W. sousae*, *Uvaria acuminata*, *U. kirkii*, *U. leptocladon*, *Vitex carvalhi*, *V. franceseana*, *V. mossambicensis*, *Xylopia lukei*, *X. tenuipetiolata*.

Photographic credits *top*: west of Pundanhar, Cabo Delgado Province. photo: J. Burrows; *bottom*: *Guibourtia schliebenii* dry forest, Quiterajo, Cabo Delgado Province. photo: J. Timberlake.

RLE Assessment

Assessment Summary

This ecosystem has a restricted geographic distribution but there is little evidence of ongoing declines in extent. However, moderate to high degradation levels are present across almost the entire distribution of the ecosystem. **Vulnerable**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 10.45% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 55 10 x 10 km grid cells and an EOO of 7667.97 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 17.71% of the current distribution faces >90 percent degradation severity, 33.99% of the distribution faces >70 percent degradation severity, and 99.43% of the distribution faces >50 percent degradation severity. Vulnerable

Criterion E: Not evaluated

INHAMITANGA SAND FOREST

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Floresta arenosa de Inhamitanga

Biome Tropical-subtropical forests (T1)

Functional group Tropical-subtropical dry forests and thickets (T1.2)

Regional Ecosystem Southern African Dry Forest

Description

Dry deciduous forest on deep sands, with canopy trees 20-25 m tall, with emergents up to 30 m.

Distribution

Confined to Mozambique, south of lower Zambezi River, in the vicinity of Inhamitanga. Occurring in Sofala Province.

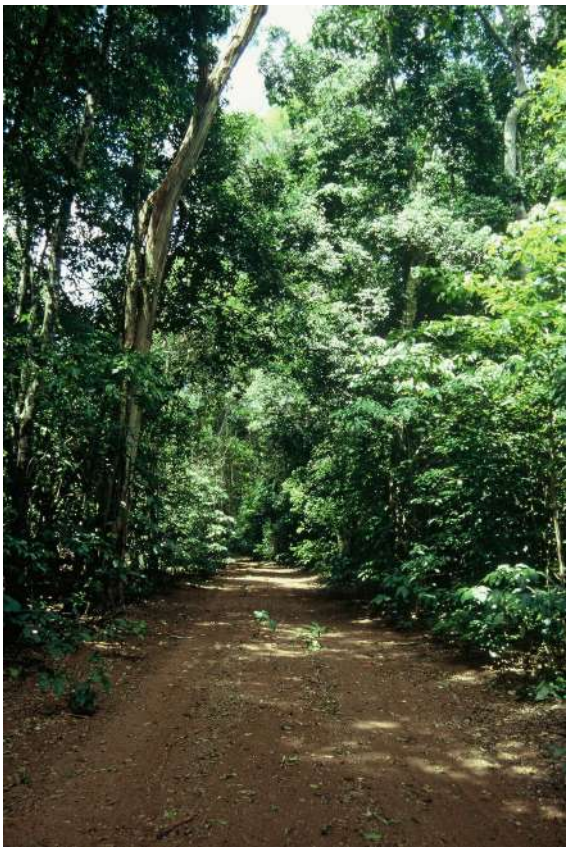
Characteristic native biota

Canopy trees dominated by *Afzelia quanzensis, Balanites maughamii, Bivinia jalbertii, Celtis mildbraedii, Croton* spp.*, Dalbergia boehmii, Dovyalis hispidula, Drypetes mossambicensis, Ficus* spp. (*F. bubu, F. lingua* subsp. *depauperata, F. natalensis* subsp. *natalensis, F. polita* subsp. *polita, F. sansibarica* subsp. *sansibarica*), *Inhambanella henriquesii*, *Lecaniodiscus fraxinifolius, Millettia stuhlmannii, Morus mesozygia, Pteleopsis myrtifolia, Terminalia sambesiaca, Zanthoxylum holtzianum,* and *Xylia torreana*.

Emergent trees, occasionally reaching 30 m or more, characteristically include*: Adansonia digitata, Afzelia quanzensis, Bombax rhodognaphalon, Cordyla africana, Milicia excelsa,* and *Sterculia appendiculata*.

Smaller trees and shrubs include *Alchornea laxiflora, Anisotes pubinervis, A. sessiflorus* subsp. *sessiliflorus, Capparis viminea* var. *viminea, Casearia gladiiformis, Cleistochlamys kirkii, Cola mossambicensis, Combretum padoides, Cordia stuhlmannii, C. megiae, C. torrei, Drypetes reticulata, Fernandoa magnifica, Rinorea arborea, Monodora stenopetala, Hunteria zeylanica, Millettia usaramensis, M. mossambicensis, Pavetta refractifolia, Rinorea arborea, Sclerochiton kirkii, Strychnos usambarensis, S. xantha, Suregada zanzibariensis, Synaptolepis alternifolia, Tapura fischeri, Tarenna longipedicellata, Vangueria esculenta* and *Xylia torreana*. The sometimes-dominant understorey small tree or shrub, *Streblus usambarensis*, is only found here and near Nangade (Cabo Delgado) in Mozambique. Likewise, the rare herbaceous understorey plant *Dorstenia zambesiaca* was described from this forest.

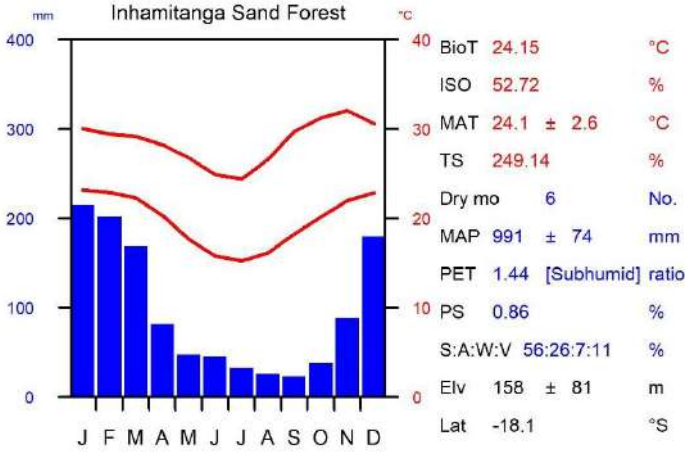
Lianes and climbers include *Clerodendrum cephalanthum* subsp. *swynnertonii, Dalbergia arbutifolia* subsp. *arbutifolia, Entada rheedii, E. chrysostachys, Dioscorea zanzibariensis,* and *Pleiocarpa orientale.*



Abiotic environment and climate

Altitude range of 30 to 380 m asl with a mean of 158 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 61.9% while the similarly measured clay content is 22.8%. Soil pH is 5.8.

Precipitation during driest quarter is 50.4 mm.



Species of Conservation Importance

Endemic Plant Species

Cephalophis lukei [NE], *Cordia megiae* [E*], *Dorstenia zambesiaca* [E], *Tarenna longipedicellata* [E].

Threatened Plant Species

Cephalophis lukei [EN], *Cordia megiae* [VU*], *Cordia stuhlmannii* [VU], *Cordia torrei* [EN], *Pleioceras orientale* [VU], *Tarenna longipedicellata* [VU], *Zanthoxylum holtzianum* [VU].

Biogeographic Anomalies

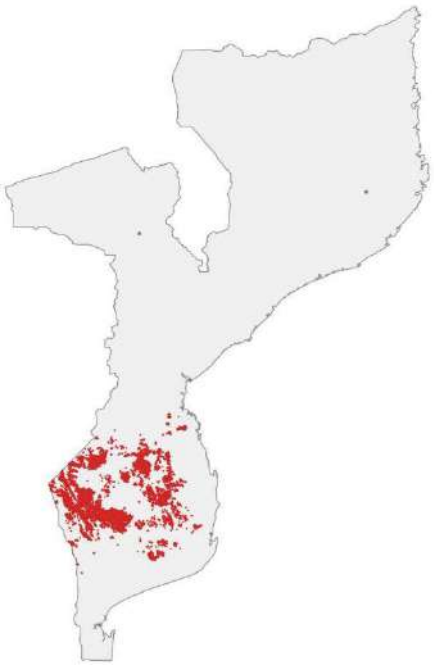
Streblus usambarensis: a widely disjunct southern record of this species, and only the second known locality in Mozambique.

Photographic credits *left*: Catapu Concession, Inhamitanga. photo: J. Burrows; *top right*: Inhamitanga Forest, Sofala Province. photo: J. Burrows; *bottom right*: forest interior, Catapu Concession, Inhamitanga. photo: M. Lotter.

RLE Assessment

Assessment Summary	Assessment Information
This ecosystem has a restricted geographic distribution but there is little evidence of ongoing declines in extent. However, moderate to high degradation levels are present across almost the entire distribution of the ecosystem. **Vulnerable**	**Criterion A:** Expansion of urban areas, agriculture & deforestation has caused a 11.7% decline since 1750. Least Concern **Criterion B:** This ecosystem has an AOO of 68 10 x 10 km grid cells and an EOO of 11462.33 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern **Criterion C:** Not evaluated **Criterion D:** Degradation assessment shows that 14.8% of the current distribution faces >90 percent degradation severity, 25.89% of the distribution faces >70 percent degradation severity, and 98.73% of the distribution faces >50 percent degradation severity. Vulnerable **Criterion E:** Not evaluated

IRONWOOD DRY FOREST



Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Floresta seca de Mecrusse
Biome Tropical-subtropical forests (T1)
Functional group Tropical-subtropical dry forests and thickets (T1.2)
Regional Ecosystem Southern African Dry Forest

Description

Short- to medium–sized dense *Androstachys* forest that is usually found in patches on deep sands. Species diversity is generally not high in this forest type.

Distribution

Dry interior of south-central Mozambique, extending into South Africa and Zimbabwe. Occurring in Gaza, Inhambane and Sofala Provinces.

Characteristic native biota

Androstachys johnsonii is the dominant, and often only, canopy tree and occurs at an average density of 4194 trees (>3 cm basal diameter) per hectare. Other canopy species include: *Acacia nigrescens*, *A. senegal* var. *leiorhachis, Afzelia quanzensis, Boscia albitrunca, Brachylaena huillensis, Cassia abbreviata, Cleistanthus schlechteri, Entandrophragma caudatum, Fernandoa magnifica, Commiphora glandulosa, C. tenuipetiolata, Guibourtia conjugata, Manilkara concolor, M. mochisia, Mimusops obtusifolia, Ptaeroxylon obliquum, Spirostachys africana, Terminalia boivinii* (in the north of this unit), and *Vitex patula.* The density and frequency of all these species is extremely low.

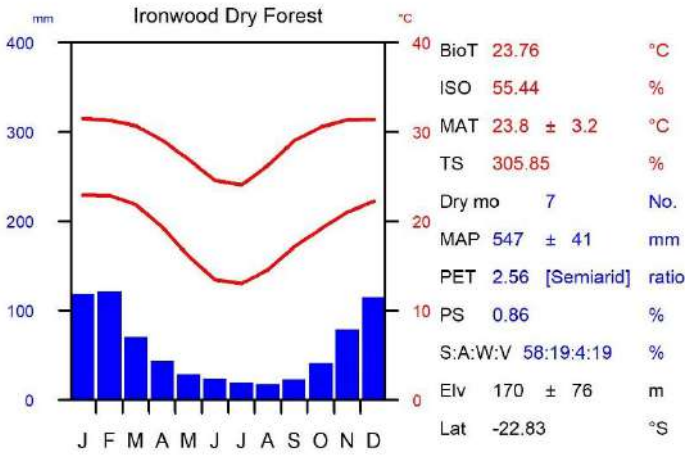
The shrub layer comprises a low species diversity and density. Recorded shrubs are *Alchornea laxiflora, Barleria matopensis, Boscia foetida* subsp. *rehmanniana, Cissus rotundifolia, Commiphora pyracanthoides, Croton madandensis, C. pseudopulchellus, Dombeya kirkii*, *Euclea divinorum, E. natalensis, Gardenia resiniflua, Heinsia crinita, Hugonia orientalis, Leptactina delagoense, Maerua kirkii, Margaritaria discoidea, Pouzolzia mixta, Sapium integerrimum, Suregada zanzibariensis, , Uvaria gracilipes. Vepris bremekampii,* and *V. myrei.*

The woody scrambler *Landolphia kirkii*, as well as the grasses *Brachiaria deflexa, Digitaria* spp., and *Panicum maximum* have also been recorded in this unit.

Abiotic environment and climate

Altitude range of 50 to 400 m asl with a mean of 170 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 60.9% while the similarly measured clay content is 23.7%. Soil pH is 6.2.

Precipitation during driest quarter is 20.8 mm.



Species of Conservation Importance

Threatened Plant Species

Vepris myrei [EN].

Photographic credits *top*: *Androstachys* forest, between Tome and Funalhuro, Inhambane Province. photo: J. Burrows; *bottom left*: Limpopo National Park. photo: M. Stalmans; *bottom right*: interior of *Androstachys* forest in Zinave National Park. photo: M. Stalmans.

RLE Assessment

Assessment Summary

This ecosystem has a widespread distribution, with little evidence of ongoing declines or widespread degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 4.21% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 418 10 x 10 km grid cells and an EOO of 123319.7 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.04% of the current distribution faces >90 percent degradation severity, 0.44% of the distribution faces >70 percent degradation severity, and 7.43% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

MADANDA SAND FOREST

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Floresta arenosa de Madanda
Biome Tropical-subtropical forests (T1)
Functional group Tropical-subtropical dry forests and thickets (T1.2)
Regional Ecosystem Southern African Dry Forest

Description

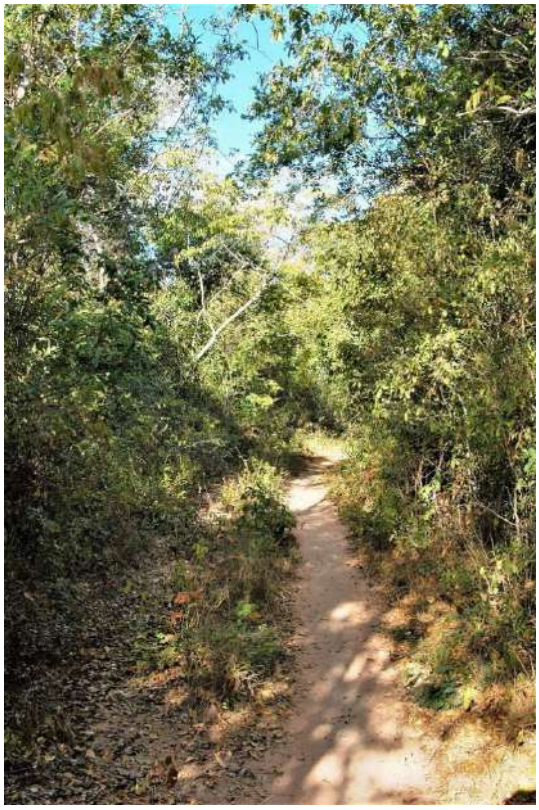
Dry deciduous forest with dense, almost impenetrable, shrub layer.

Distribution

Mostly confined to Mozambique, between Chibabave and Massangena, north of the Save River. Occurring in Manica and Sofala Provinces.

Characteristic native biota

Trees listed are *Adansonia digitata, Afzelia quanzensis, Albizia adianthifolia, A. forbesii, Balanites maughamii, Brachylaena rotundata* forma, *Brachystegia torrei, Chrysophyllum viridiflorum, Cleistanthus schlechteri, Cleistochlamys kirkii, Cordia stuhlmannii, Craibia zimmermannii, Diospyros senensis, Guibourtia conjugata, Julbernardia globiflora, Lecaniodiscus fraxinifolius, Milicia excelsa, Millettia mossambicensis, M. stuhlmannii, Pteleopsis myrtifolia, Pterocarpus lucens* subsp. *antunesii, Strychnos potatorum,* and *Xylia torreana.*



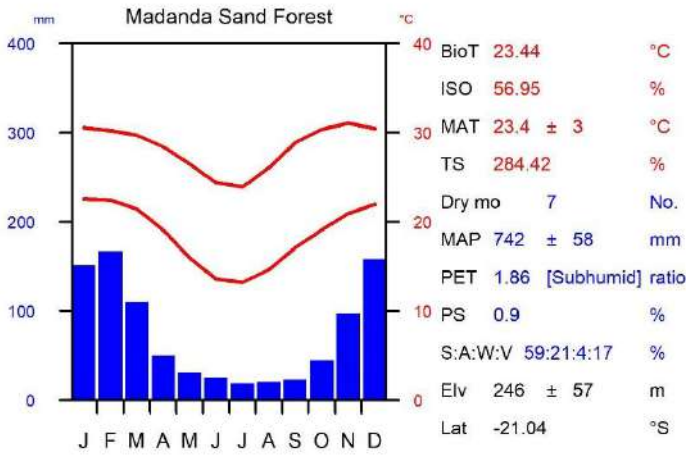
Shrubs recorded are *Canthium glaucum* subsp. *frangula*, *Catunaregam swynnertonii*, *Citropsis daweana, Clerodendrum pleiosciadium, Combretum collinum, C. microphyllum, Croton madandensis, Dichapetalum barbosae, Fernandoa magnifica, Grewia lepidopetala, G. micrantha, Markhamia zanzibarica, Millettia usaramensis, Monodora junodii, Paropsia braunii, Psorospermum febrifugum, Securidaca longipedunculata, Vitex ferruginea, Vernonia* sp., and *Zanthoxylum holtzianum.*

Climbers and scramblers include *Artabotrys monteiroae, Dalbergia arbutifolia, Landolphia kirkii* (once dominant), *Paralepistemon shirensis,* and *Strychnos xantha.*

Abiotic environment and climate

Altitude range of 140 to 410 m asl with a mean of 246 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 59.3% while the similarly measured clay content is 24.3%. Soil pH is 6.1.

Precipitation during driest quarter is 30.8 mm.



Species of Conservation Importance

Endemic Plant Species

Ceropegia muchevensis [E*], *Euphorbia plenispina* [E].

Threatened Plant Species

Ceropegia muchevensis [CR*].

Photographic credits Madanda Forest, Sofala Province. photo: M. Lotter.

RLE Assessment

Assessment Summary

This ecosystem has a relatively restricted geographic distribution, and there is little evidence of ongoing declines nor high levels of degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 26.75% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 68 10 x 10 km grid cells and an EOO of 8183.73 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 30.09% of the current distribution faces >90 percent degradation severity, 54.58% of the distribution faces >70 percent degradation severity, and 86.62% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

MAPUTALAND SAND FOREST

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Floresta arenosa de Maputaland
Biome Tropical-subtropical forests (T1)
Functional group Tropical-subtropical dry forests and thickets (T1.2)
Regional Ecosystem Southern African Dry Forest

Description

Semi-deciduous forest with a dense or broken canopy occurring on old dunes up to 100 km from the coast and occasionally interspersed with Licuati Thicket.

Distribution

Occurring south of Maputo in Maputo Province and extending into KwaZulu-Natal, South Africa. Poorly mapped in the Maputo region based on a history of logging from when the Portuguese first arrived. Currently mapped extent based on estimates and soil nutrient.

Characteristic native biota

The trees are represented by *Afzelia quanzensis, Albizia adianthifolia, A. versicolor, Apodytes dimidiata* subsp. *dimidiata, Balanites maughamii* subsp. *maughamii, Berchemia zeyheri, Brachylaena discolor, Bridelia micrantha, Casearia gladiiformis, Clausena anisata, Cleistanthus schlechteri, Clerodendrum glabrum, Commiphora schlechteri, Dialium schlechteri, Diospyros inhacaensis, D. natalensis, Drypetes natalensis, Erythrophleum lasianthum, Hymenocardia ulmoides, Inhambanella henriquesii, Lannea antiscorbutica, Manilkara concolor, Margaritaria discoidea* var. *fagifolia, Newtonia hildebrandtii, Pteleopsis myrtifolia, Pseudobersama mossambicensis, Psydrax obovata* var. *obovata, Rothmannia fischeri* var. *moramballae, Shirakiopsis elliptica, Sideroxylon inerme, Suregada zanzibariensis, Strychnos gerrardii, Sclerocroton integerrimus, Tabernaemontana elegans, Tapura fischeri, Vepris lanceolata, Wrightia natalensis*, and *Zanthoxylum delagoense*. The conifer *Afrocarpus falcatus* is a rare component of these forests.

Shrubs and small trees include *Acacia kraussiana, Acokanthera oppositifolia, Artabotrys monteiroae, Carissa bispinosa* subsp. *bispinosa, Cavacoa aurea, Deinbollia oblongifolia, Dovyalis longispina, Empogona coriacea, E. maputensis, Erythroxylum delagoense, Eugenia mossambicensis, Kraussia floribunda, Maerua nervosa, Monanthotaxis caffra, Monodora junodii* var. *junodii, Mystroxylon aethiopicum, Oxyanthus latifolius, Pavetta gerstneri, Psychotria capensis, Psydrax locuples, Rytigynia umbellulata, Suregada zanzibarensis, Teclea gerrardii, Tricalysia delagoensis,* and *Xylotheca kraussiana.*

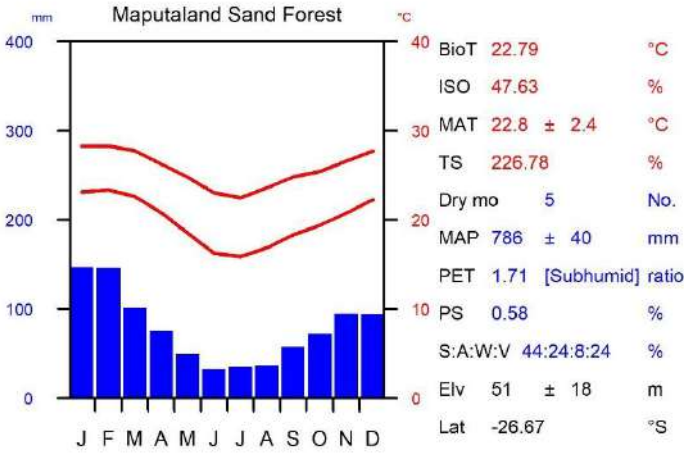
Climbers and lianes include *Adenia gummifera, Ancylobotrys petersianus, Asparagus falcatus, Capparis brassii, Dalbergia obovata, Distephanus inhacensis, Grewia caffra, Landolphia kirkii, Scutia myrtina*, and *Tiliacora funifera.*

Herbaceous layer has *Asystasia gangetica, Achyranthes aspera, Cyperus albostriatus, Dicliptera clinopodia, Isoglossa woodii, Laportea peduncularis, Microsorum scolopendria, Oplismenus hirtellus*, and *Zamioculcas zamiifolia.*

Abiotic environment and climate

Altitude range of 10 to 120 m asl with a mean of 51 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 73.7% while the similarly measured clay content is 16.0%. Soil pH is 5.8.

Precipitation during driest quarter is 77.3 mm.



Species of Conservation Importance

Endemic Plant Species

Aneilema arenicola [NE], *Dicliptera quintasii* [NE].

Threatened Plant Species

Dicliptera quintasii [EN].

Photographic credits *left & right:* Maputo Special Reserve, Maputo Province. photos: M. Stalmans.

RLE Assessment

Assessment Summary

This ecosystem has a restricted geographic distribution but there is little evidence of ongoing declines in extent. However, moderate degradation levels are present across almost the entire distribution of the ecosystem. **Vulnerable**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 3.75% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 16 10 x 10 km grid cells and an EOO of 1023.17 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 1.03% of the current distribution faces >90 percent degradation severity, 7.65% of the distribution faces >70 percent degradation severity, and 97.38% of the distribution faces >50 percent degradation severity. Vulnerable

Criterion E: Not evaluated

SAVE SAND FOREST

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Floresta arenosa do Save
Biome Tropical-subtropical forests (T1)
Functional group Tropical-subtropical dry forests and thickets (T1.2)
Regional Ecosystem Southern African Dry Forest

Description

Medium to tall deciduous forest on deep sands, dominated by *Brachystegia torrei*.

Distribution

Predominantly just south of the Save River, extending westwards and just across the border into Zimbabwe. Occurring in Gaza, Inhambane, Manica and Sofala Provinces.

Characteristic native biota

The most characteristic tree of this forest type is *Brachystegia torrei* which often dominates the canopy. However other trees may also be frequent in areas, mainly *Afzelia quanzensis, Albizia forbesii, Balanites maughamii, Boscia mossambicensis, Cassipourea mossambicensis, Cleistanthus schlechteri, Cordyla africana, Drypetes arguta, Erythrophleum lasianthum, Guibourtia conjugata, Hymenocardia ulmoides, Lasiodiscus pervillei, Lecaniodiscus fraxinifolius, Millettia stuhlmannii, M. usaramensis* subsp. *australis, Newtonia hildebrandtii, Pseudolachnostylis maprouneifolia, Pteleopsis myrtifolia, Pterocarpus lucens* subsp. *antunesii, Strychnos potatorum, S. usambarensis, Xeroderris stuhlmannii, Xylia torreana, Xylopia gracilipes,* and *Zanthoxylum holtzianum*.

The understorey is particularly diverse and notably rich in the family Rubiaceae. The small trees and woody shrubs are represented by *Afrocanthium racemulosum, Alchornea laxiflora, Allophylus rubifolius* var. *alnifolius, Baphia massaiensis* subsp. *obovata, Carpodiptera africana, Carpolobia suaveolens, Chazaliella abrupta, Citropsis daweana, Clerodendrum incisum, C. pleiosciadium, Coffea racemosa, Craibia zimmermannii, Dalbergia nitidula, Empogona coriacea, E. junodii, Grewia hornbyi, Heinsia crinita* subsp. *parviflora, Hugonia orientalis, Hyperacanthus microphyllus, Indigofera fulgens, Lagynias dryadum, Leptactina delagoensis, Maerua juncea* subsp. *crustata, M. kirkii, Markhamia zanzibarica, Monodora junodii* var. *macrantha, Oxyanthus latifolius, Paropsia braunii, Pavetta gracillima, Psychotria amboniana* subsp. *mosambicensis, Psydrax kraussioides, P. locuples, Strychnos panganensis, S. xantha, Suregada zanzibarensis, Thilachium africanum, Tricalysia delagoensis, Uvaria gracilipes, U. lucida* subsp. *virens,* and *Vitex ferruginea*. Climbers include *Acacia kraussiana, Capparis erythrocarpos* var. *rosea, Cissampelos mucronata, Dalbergia arbutifolia, Landolphia kirkii, Salacia madagascariensis, Strophanthus kombe, S. petersianus, Synaptolepis oliveriana*, and *Tiliacora funifera.*

Soft shrubs and herbaceous species are fewer, including *Asparagus petersianus, Barleria spinulosa Commelina africana* var. *glabriuscula, Commelina erecta* subsp. *livingstonii,* with epiphytes recorded being *Ansellia africana* and *Microcoelia exilis*. Grasses: *Oplismenus hirtellus, Panicum* spp.

Abiotic environment and climate

Altitude range of 40 to 360 m asl with a mean of 181 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 62.0% while the similarly measured clay content is 22.7 %. Soil pH is 6.1.

Precipitation during driest quarter is 30.6 mm.

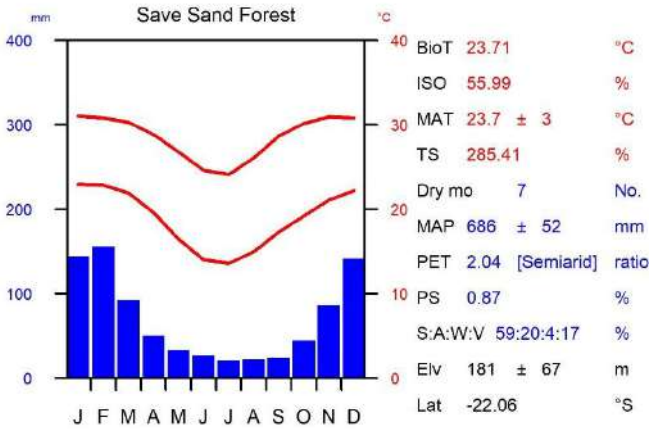
Species of Conservation Importance

Threatened Plant Species

Erythrophleum lasianthum [NT], *Psychotria amboniana* subsp. *mosambicensis* [VU], *Zanthoxylum holtzianum* [VU].

Biogeographic Anomalies

Although there are no recorded species endemic to this vegetation unit, it does support a few species that are endemic to Mozambique, such as *Carpolobia suaveolens, Glyphea tomentosa, Pavetta gracillima* and *Psychotria amboniana* subsp. *mosambicensis.*



Photographic credits *left*: 2.64 km SW of Malevane, Inhambane Province. photo: W. McCleland; *right*: Save Sand Forest, Pande, Inhambane Province. photo: J. Burrows.

RLE Assessment

Assessment Summary	Assessment Information
This ecosystem is relatively widespread and there is little evidence of declines in extent or degradation. **Least Concern**	**Criterion A:** Expansion of urban areas, agriculture & deforestation has caused a 11.52% decline since 1750. Least Concern **Criterion B:** This ecosystem has an AOO of 115 10 x 10 km grid cells and an EOO of 49835.9 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern **Criterion C:** Not evaluated **Criterion D:** Degradation assessment shows that 0.14% of the current distribution faces >90 percent degradation severity, 1.15% of the distribution faces >70 percent degradation severity, and 15.08% of the distribution faces >50 percent degradation severity. Least Concern **Criterion E:** Not evaluated

ZAMBEZI VALLEY SAND FOREST

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Floresta arenosa do vale do Zambeze
Biome Tropical-subtropical forests (T1)
Functional group Tropical-subtropical dry forests and thickets (T1.2)
Regional Ecosystem Southern African Dry Forest

Description

Structurally this type is a closed-canopy dry forest. The upper layer comprises an open cover (5-10%) of tall trees (15-20 m), and below this is a shorter (6-10 m) and denser (20-50% cover) tree layer.

Distribution

Occurring in western part of Zambezi valley, extending into Zimbabwe and Zambia. Recorded in Manica, Sofala, and Tete Provinces.

Characteristic native biota

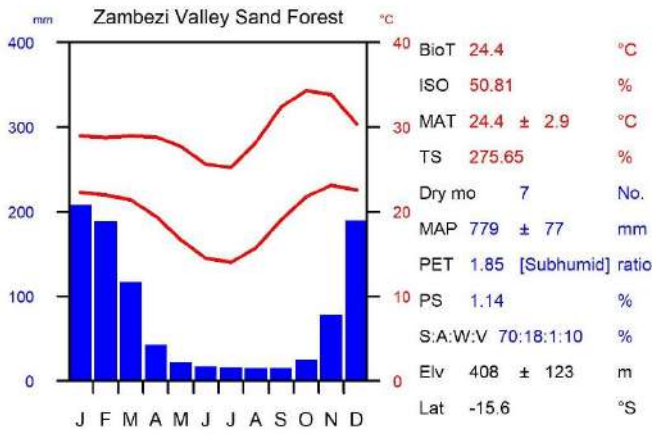
Patches north of Tete are dominated by large specimens of *Pterocarpus lucens* subsp. *antunesii*; and also *Acacia nigrescens*. Understorey small tree and shrubs recorded are *Acalypha ornata, Solanum tettense* var. *tettense, Chazaliella abrupta, Triaspis macropteron* subsp. *massaiensis, Hymenodictyon parvifolium, Pavetta refractifolia,* and *Tarenna luteola*.

Further west the canopy layer is comprised of *Acacia nigrescens, Adansonia digitata, Afzelia quanzensis, Berchemia discolor, Commiphora karibensis, Cordyla africana, Entandrophragma caudatum, Kirkia acuminata, Philenoptera violacea, Pteleopsis myrtifolia, Pterocarpus lucens* subsp. *antunesii, Strychnos potatorum and Xeroderris stuhlmannii.* Below this is a shorter (6-10 m) and denser tree layer dominated by *Xylia torreana.* Beneath this is a thicket layer dominated by *Acacia ataxacantha, Croton longipedicellatus, Friesodielsia obovata* and *Meiostemon tetrandrus.* Other common species include *Boscia mossambicensis, Capparis tomentosa, Combretum elaeagnoides* and *Monodora junodii*. Total canopy cover is almost 100%. The herbaceous layer is very poorly developed, with grasses being virtually absent.

Abiotic environment and climate

Altitude range of 90 to 730 m asl with a mean of 408 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 56.7% while the similarly measured clay content is 25.7 %. Soil pH is 6.1.

Precipitation during driest quarter is 6.5 mm.



Species of Conservation Importance

Biogeographic Anomalies

Although no endemic or threatened species are recorded from this unit, it does support some of the largest specimens of *Pterocarpus lucens* subsp. *antunesii* known in Mozambique.

Photographic credits *left & right*: sand forest 110 km NNW of Tete on N9, Tete Province. photos: J. Burrows.

RLE Assessment

Assessment Summary

This ecosystem is relatively widespread and there is little evidence of declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 7.21% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 47 10 x 10 km grid cells and an EOO of 75231.97 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0% of the current distribution faces >90 percent degradation severity, 0.76% of the distribution faces >70 percent degradation severity, and 16.89% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

LICUATI SAND THICKET

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Brenha arenosa do Licuáti

Biome Tropical-subtropical forests (T1)

Functional group Tropical-subtropical dry forests and thickets (T1.2)

Regional Ecosystem Southern African Dry Thicket

Description

Very dense thicket of 3-8 m (short forest) with scattered taller trees or pockets of taller trees with canopies of up to 15 m. Well developed shrub layer with poorly developed herbaceous layer. Rich in endemic species. Floristically somewhat related to the Maputaland Sand Forest although structurally very short and dense and missing the forest strata. Also differs from dune thicket which is dominated by *Mimusops caffra* on recent dunes.

Distribution

Restricted to Mozambique, south of Maputo, Maputo Province.

Characteristic native biota

Composed largely of *Artabotrys monteiroae, Boscia foetida* subsp. *filipes, Brachylaena huillense, Canthium armatum, Cassipourea mossambicensis, Cleistanthus schlechteri, Combretum celastroides, C. mkuzense, Coptosperma littorale, C. supra-axillare, Croton pseudopulchellus, C. steenkampianus, Dialium schlechteri, Diospyros natalensis, Drypetes arguta, D. natalensis, Empogona junodii, E. lanceolata, E. maputensis, Eugenia mossambicensis, Erythroxylum emarginatum, Grewia microthyrsa, Hyperacanthus microphyllus, Lagynias lasiantha, L. monteiroi, Leptactina delagoensis, Monodora junodii* var. *junodii, Ochna barbosae, O. natalitia, Oxyanthus latifolius, Pavetta catophylla, P. gerstneri, Psydrax locuples, P. fragrantissima, Pteleopsis myrtifolia, Rytigynia celastroides* var. *australis, Sclerochiton apiculatus, Strychnos henningsii, S. decussata, Tricalysia delagoensis, Uvaria caffra, U. lucida* subsp. *virens, Vepris bremekampii, Vitex ferruginea, V. patula, Warneckea parvifolia,* and *Xylopia torrei*.

There are a few emergents such as *Afzelia quanzensis, Balanites maughamii, Erythrophleum lasianthum, Manilkara discolor and Newtonia hildebrandtii.* Representative climbers and scramblers include *Acridocarpus natalitius* var. *linearifolius*, *Ancylobotrys petersiana, Capparis brassii, Cissampelos hirta, Hippocratea delagoensis, Landolphia kirkii, Rhoicissus revoilii, Schlechterina mitostemmatoides, Secamone delagoensis, Strophanthus luteolus*, and *Synaptolepis kirkii.*

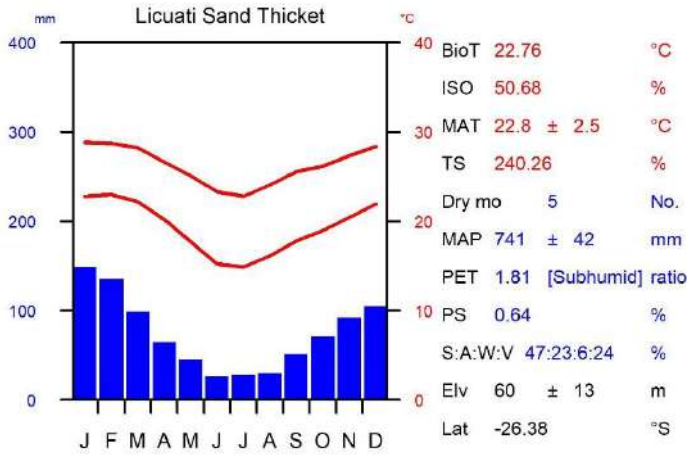
Shrubs and herbs recorded are *Aneilema zebrinum, Asparagus densiflorus, A. natalensis, Ceropegia carnosa.* Grasses are almost absent within the thicket.

Grassy clearings within the pure thicket are occupied by patches of Tembe Sandy Bushveld represented typically in this area by *Albizia adianthifolia, Aneilema indehiscens* subsp. *lilacinum, Carissa tetramera*, *Combretum molle, Commelina africana* var. *africana, C. bracteosa* var. *bracteosa, C. bracteosa* var. *lagosensis, Dicerocaryum forbesii, Garcinia livingstonei, Helichrysum kraussii, Indigofera podophylla, Murdannia simplex, Pavetta vanwykiana, Salacia kraussii, Securidaca longepedunculata, Strychnos madagascariensis, S. spinosa*, and *Terminalia sericea.*

Abiotic environment and climate

Altitude range of 25 to 85 m asl with a mean of 60 m. On deep sands of ancient dunes. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 74.3% while the similarly measured clay content is 16.9%. Soil pH is 5.8.

Precipitation during driest quarter is 55.5 mm.



Species of Conservation Importance

Endemic Plant Species

Rytigynia celastroides var. *australis* [NE*] is endemic to Licuati Sand Thicket but the following are endemic or near-endemic to Mozambique: *Acridocarpus natalitius* var. *linearifolius* [NE], *Dicliptera quintasii* [NE], *Empogona maputensis* [NE], *Pavetta vanwykiana* [NE], *Polygala francisci* [NE], *Psydrax fragrantissima* [NE], *Sclerochiton apiculatus* [NE], *Warneckea parvifolia* [NE] and *Xylopia torrei* [E].

Threatened Plant Species

Combretum mkuzense [NT], *Dicliptera quintasii* [VU], *Empogona maputensis* [EN], *Erythrophleum lasianthum* [NT], *Polygala francisci* [VU], *Psydrax fragrantissima* [NT], *Rytigynia celastroides* var. *australis* [VU*],*Sclerochiton apiculatus* [VU], *Warneckea parvifolia* [EN], *Xylopia torrei* [EN].

Biogeographic Anomalies

The rare *Aneilema zebrina* (Commelinaceae) is known only in Mozambique from Licuati Sand Thicket. Also *Combretum mkuzense*, *Empogona lanceolata*, *Lagynias monteiroi*, and *Strophanthus luteolus* are important biogeographic records for Mozambique.

Photographic credits track through the thicket in Licuati Forest Reserve, Maputo Province. photo: J. Burrows.

RLE Assessment

Assessment Summary

This ecosystem has a restricted geographic distribution but there is little evidence of ongoing declines in extent. However, moderate degradation levels are present across almost the entire distribution of the ecosystem. **Vulnerable**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 10.34% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 14 10 x 10 km grid cells and an EOO of 893.63 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 2.77% of the current distribution faces >90 percent degradation severity, 14.37% of the distribution faces >70 percent degradation severity, and 96.09% of the distribution faces >50 percent degradation severity. Vulnerable

Criterion E: Not evaluated

MADANDA RUBBER SAND THICKET

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Brenha arenosa de Madanda

Biome Tropical-subtropical forests (T1)

Functional group Tropical-subtropical dry forests and thickets (T1.2)

Regional Ecosystem Southern African Dry Thicket

Description

Tall dense thicket which usually forms a mosaic with the taller Madanda Sand Forest. The thicket-like areas may be secondary (successional) or where soil or rainfall are not conducive to taller forest.

Distribution

Limited to Mozambique, from just south of Beira, southwards towards Massangena. Occurring in Manica and Sofala Provinces.

Characteristic native biota

Emergents of *Adansonia digitata, Albizia adianthifolia, Brachylaena rotundata* forma of Burrows *et al.* (2018), *Cordyla africana, Guibourtia conjugata, Millettia stuhlmannii, Newtonia hildebrandtii, Pteleopsis myrtifolia, Pterocarpus lucens,* and *Xylia torreana* occur throughout the thicket unit, with occasional areas of miombo (*Brachystegia spiciformis* and *Julbernardia globiflora*) than can create a mosaic.

The dense thickets are comprised of *Cleistochlamys kirkii, Combretum* (*C. collinum, C. hereroense, C. zeyheri, C. molle, and C. apiculatum*), *Dalbergia fischeri, Fernandoa magnifica, Grewia micrantha, Landolphia kirkii, Lecaniodiscus fraxinifolius, Markhamia zanguebarica, Tabernaemontana elegans, Turraea nilotica, Vitex doniana, V. payos* var. *glabrescens,* and *V. ferruginea.*

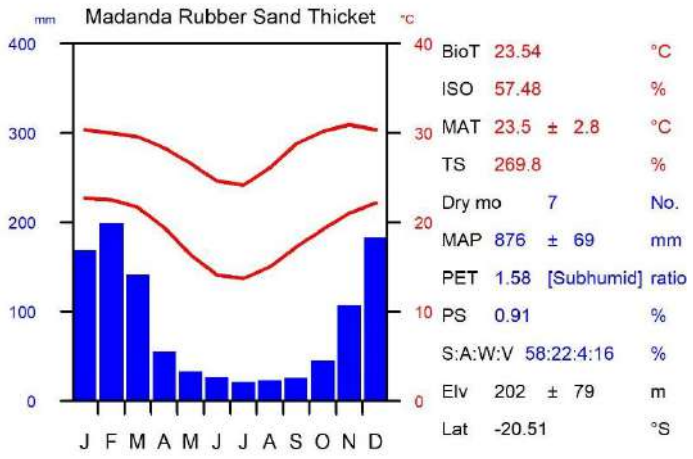
Sometimes the thicket opens up into a woodland area with *Burkea africana, Combretum adenogonium, Diplorhynchus condylocarpon, Piliostigma thonningii,* and *Swartzia madagascariensis.*

Climbers include *Landolphia kirkii* (rubber vine), *Opilia amentacea, Artabotrys monteiroi, Monanthotaxis trichocarpa,* and *Synaptolepis alternifolia.* The herbaceous layer includes *Rhynchosia hirta* and *Panicum maximum*.

Abiotic environment and climate

Altitude range of 35 to 375 m asl with a mean of 202 m. On deep sands of ancient dunes. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 63.0% while the similarly measured clay content is 22.2%. Soil pH is 6.0.

Precipitation during driest quarter is 39.6 mm.



Species of Conservation Importance: none recorded.

RLE Assessment

Assessment Summary

This ecosystem has a restricted geographic distribution but there is little evidence of ongoing declines in extent. However, moderate to high degradation levels are present across almost the entire distribution of the ecosystem. **Vulnerable**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 29.63% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 87 10 x 10 km grid cells and an EOO of 10270.02 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 51.54% of the current distribution faces >90 percent degradation severity, 83.32% of the distribution faces >70 percent degradation severity, and 93.58% of the distribution faces >50 percent degradation severity. Vulnerable

Criterion E: Not evaluated

MAKONDE BAMBOO THICKET

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Brenha de bamboo de Makonde
Biome Tropical-subtropical forests (T1)
Functional group Tropical-subtropical dry forests and thickets (T1.2)
Regional Ecosystem Southern African Dry Thicket

Description

Dense impenetrable bamboo thicket with occasional patches of Mueda Dry Sand Thicket.

Distribution

Occurs between Mueda (Cabo Delgado) and Metangula (Niassa), and southwards towards Montepuez. It is not known whether it extends into Tanzania.

Patches of bamboo also occur across Niassa and into the highlands of Tete province near Zambia, but little is known of them and they have not been mapped.

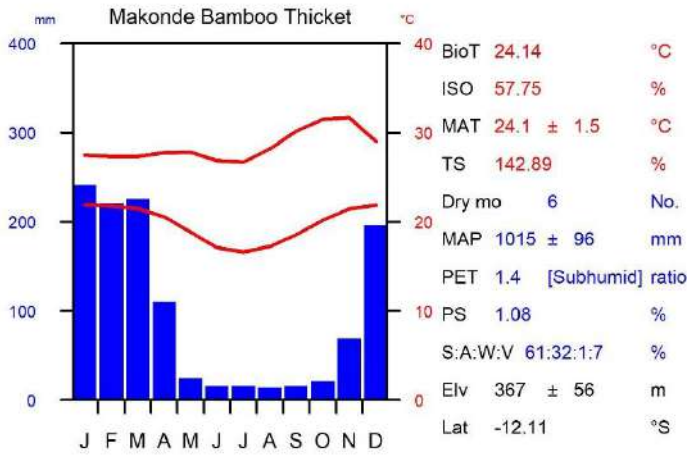
Characteristic native biota

Impenetrable thicket dominated almost entirely of *Oxytenanthera abyssinica*. Rather poorly known or documented. Other species recorded within or around this vegetation type include *Acacia nigrescens, Acacia polyacantha* subsp. *campylacantha, Albizia harveyi, Baphia massaiensis* subsp. *gomesii, Blepharispermum brachycarphum, Dalbergia boehmii, D. melanoxylon, Dombeya shupangae, Markhamia obtusifolia,* and *Pteleopsis myrtifolia.*

Abiotic environment and climate

Altitude range of 200 to 470 m asl with a mean of 367 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 51.0% while the similarly measured clay content is 29.0%. Soil pH is 6.1.

Precipitation during driest quarter is 5.8 mm.



Species of Conservation Importance: none recorded.

Photographic credits *left*: Niassa National; Park, near Mecula; *right*: track from Mueda to Negamano, Cabo Delgado Province. photo left: M. Lotter, photo right: J. Burrows.

RLE Assessment

Assessment Summary

This ecosystem has a restricted geographic distribution but there is little evidence of ongoing declines in extent. However, moderate to high degradation levels are present across almost the entire distribution of the ecosystem. **Vulnerable**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 0.53% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 102 10 x 10 km grid cells and an EOO of 10223.18 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.03% of the current distribution faces >90 percent degradation severity, 1.14% of the distribution faces >70 percent degradation severity, and 83.3% of the distribution faces >50 percent degradation severity. Vulnerable

Criterion E: Not evaluated

MAZOE GNEISS DRY THICKET

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Brenha em gneiss jess de Mazoé

Biome Tropical-subtropical forests (T1)

Functional group Tropical-subtropical dry forests and thickets (T1.2)

Regional Ecosystem Southern African Dry Thicket

Description

A poorly known deciduous dry thicket community that was also recognised in previous studies (Cunliffe 2002), but not surveyed. It is discernible on satellite imagery and occurs on Rushinga gneiss geology.

Distribution

From Gunganyama south-eastwards towards Nyamapanda, Tete Province. Also in Zimbabwe.

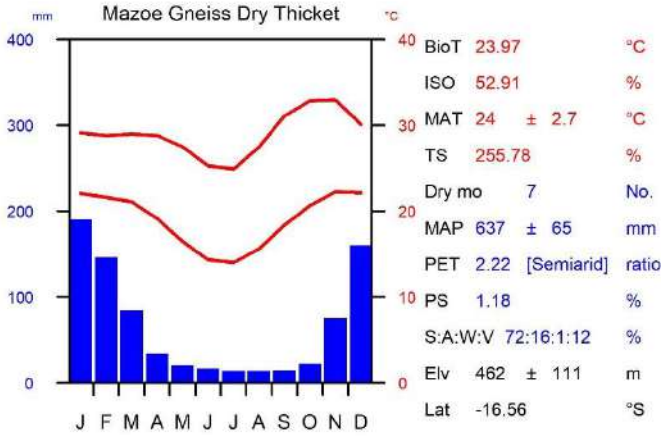
Characteristic native biota

Poorly known but expected to include *Acacia* spp., *Afzelia quanzensis, Albizia brevifolia, A. forbesii, Berchemia zeyheri, Combretum* spp. including *Combretum apiculatum, C. mollis, Commiphora edulis, Dalbergia melanoxylon, Kirkia acuminata, Lannea schweinfurthii, Markhamia obtusifolia, Philenoptera violacea, Senna singueana, Strychnos potatorum, S. spinosa, Terminalia brachystemma,* and *T. sericea.*

Abiotic environment and climate

Altitude range of 260 to 810 m asl with a mean of 462 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 49.2% while the similarly measured clay content is 30.3.0%. Soil pH is 6.3.

Precipitation during driest quarter is 3 mm.



Species of Conservation Importance: none recorded.

RLE Assessment

Assessment Summary

This ecosystem is relatively widespread and there is little evidence of declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 12.6% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 34 10 x 10 km grid cells and an EOO of 4228.97 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.01% of the current distribution faces >90 percent degradation severity, 0.8% of the distribution faces >70 percent degradation severity, and 15.9% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

MUEDA DRY SAND THICKET

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Brenha seca arenosa de Mueda

Biome Tropical-subtropical forests (T1)

Functional group Tropical-subtropical dry forests and thickets (T1.2)

Regional Ecosystem Southern African Dry Thicket

Description

A dense thicket community clearly distinguishable on satellite imagery occurring in amongst the Makonde Bamboo Thicket. The impenetrable bamboo thicket limits access and little is known about this community.

Distribution

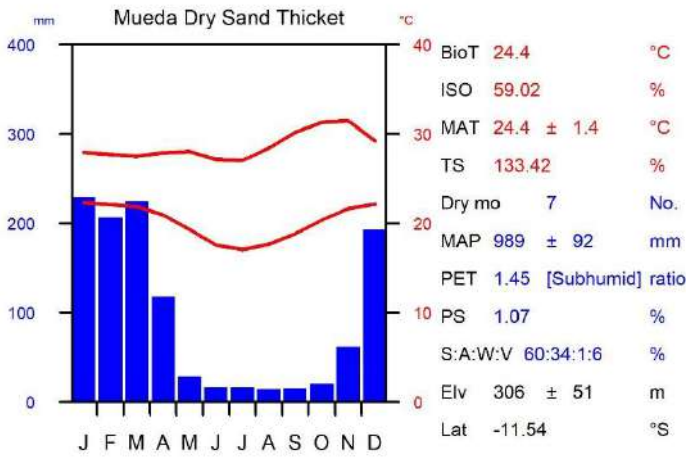
West of Mueda plateau, between Negomano and north of Nantulo, Cabo Delgado Province, often forming a mosaic with Makonde Bamboo Thicket.

Characteristic native biota

Short dense thicket with occasional emergents such as *Adansonia digitata, Afzelia quanzensis, Balanites maughamii, Bombax rhodognaphalon, Cordyla africana, Pteleopsis myrtifolia,* and *Sterculia schliebenii*. The shorter thicket-forming trees consisted of *Boscia salicifolia, Combretum pisoniiflorum, Fernandoa magnifica, Hilsenbergia petiolaris, Markhamia zanzibarica,* and *Vitex doniana*.

Thickets *of Oxytenanthera abyssinica* may form a mosaic within the Mueda Dry Sand Thicket.

On less sandy soils this unit may form a mosaic with more typical woodland species such as *Dalbergia melanoxylon, Dombeya shupangae*, *Julbernardia globiflora,* and *Terminalia sericea,* with *Acacia nigrescens* and *Acacia polyacantha* subsp. *campylacantha* on heavier clay soils.



Abiotic environment and climate

Altitude range of 210 to 450 m asl with a mean of 306 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 52.7% while the similarly measured clay content is 27.6%. Soil pH is 6.0.

Precipitation during driest quarter is 6.2 mm.

Species of Conservation Importance: none recorded.

RLE Assessment

Assessment Summary

This ecosystem has a restricted geographic distribution but there is little evidence of ongoing declines in extent. However, moderate degradation levels are present across almost the entire distribution of the ecosystem. **Vulnerable**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 0.63% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 23 10 x 10 km grid cells and an EOO of 1840.5 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.02% of the current distribution faces >90 percent degradation severity, 1.72% of the distribution faces >70 percent degradation severity, and 99.29% of the distribution faces >50 percent degradation severity. Vulnerable

Criterion E: Not evaluated

NWAMBIYA SAND THICKET

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Brenha arenosa de Nwambiya

Biome Tropical-subtropical forests (T1)

Functional group Tropical-subtropical dry forests and thickets (T1.2)

Regional Ecosystem Southern African Dry Thicket

Description

Dense thickets of 4-6 m (short forest) with scattered taller trees on level upland sandy plains.

Distribution

In Mozambique, South Africa and Zimbabwe, adjacent to Kruger and Gonarezhou National Parks in Gaza Province.

Characteristic native biota

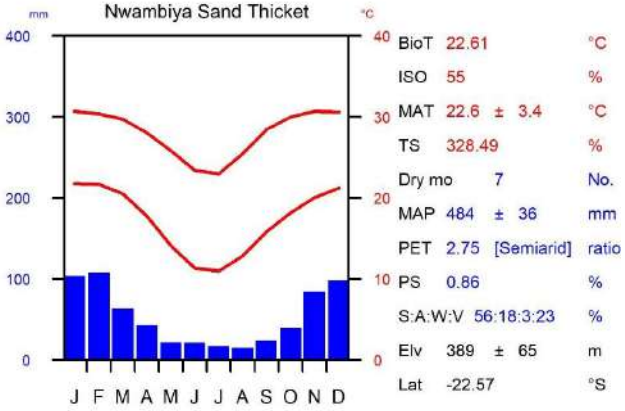
The tree species include *Afzelia quanzensis, Albizia forbesii, Balanites maughamii, Cleistanthus schlechteri, Combretum collinum* subsp. *taborense, C. mkuzense, Commiphora glandulosa, Guibourtia conjugata, Pteleopsis myrtifolia, Pterocarpus lucens* subsp. *antunesii, Xeroderris stuhlmannii,* and *Xylia torreana.*

Small trees and woody shrubs include *Alchornea laxiflora*, *Baphia massaiensis* subsp. *obovata, Boscia filipes, Bullockia setiflora, Clerodendrum pleiosciadium, Combretum celastroides* subsp. *orientale, Coptosperma zygoon, Croton steenkampianus, Dalbergia nitidula, Diospyros loureriana, Erythrococca menyhartii, Heinsia crinita, Gymnosporia oxycarpa, G. pubescens, Hugonia orientalis, Lagynias lasiantha, Leptactina delagoensis, Markhamia zanzibarica, Monodora junodii* var. *macrantha, Ochna barbosae, Paropsia braunii, Pavetta catophylla, Phyllanthus pinnatus, Uvaria gracilipes, U. lucida* subsp. *virens, Vepris bremekampii, Xylopia parviflora,* and *Xylotheca kraussiana* var. *kraussiana.* More ephemeral shrubs include *Indigofera fulgens, Salacia kraussii,* and *Tephrosia polystachya.* Climbers include *Strophanthus kombe.*

Abiotic environment and climate

Altitude range of 240 to 515 m asl with a mean of 389 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 65.6% while the similarly measured clay content is 21.0%. Soil pH is 6.5.

Precipitation during driest quarter is 14.5 mm.



Species of Conservation Importance: none recorded.

Photographic credits *left*: *Baphia-Guibourtia* sand thicket, Limpopo National Park; *right*: Nwambyia Sand Thicket from the air, Limpopo National Park, Maputo Province. photos: M. Stalmans.

RLE Assessment

Assessment Summary

This ecosystem is relatively widespread and there is little evidence of declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 4.13% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 56 10 x 10 km grid cells and an EOO of 7350.8 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.01% of the current distribution faces >90 percent degradation severity, 0.86% of the distribution faces >70 percent degradation severity, and 14.08% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

PANDE SAND THICKET

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Brenha arenosa de Pande
Biome Tropical-subtropical forests (T1)
Functional group Tropical-subtropical dry forests and thickets (T1.2)
Regional Ecosystem Southern African Dry Thicket

Description

A dense and short semi-deciduous thicket.

Distribution

Limited to Mozambique, south of the Save River, between Pande and Mapie. Occurring in Inhambane Province.

Characteristic native biota

A dense thicket with a few emergent species of *Adansonia digitata, Balanites maughamii,* and *Cordyla africana*, with the main thicket dominated by *Hymenocardia ulmoides* and *Spirostachys africana*, in addition to the following trees and shrubs:

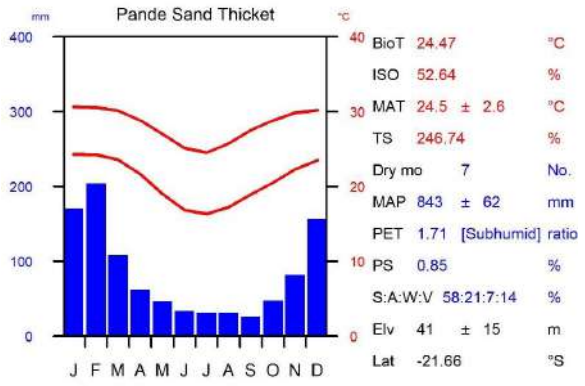
Bauhinia burrowsii, Bivinia jalbertii, Burkea africana, Carissa praetermissa, C. tetramera, Carpodiptera africana, Cassipourea mossambicensis, Commiphora schlechteri, Coptosperma zygoon, Craibia zimmermannii, Croton aceroides, C. gratissimus, C. inhambanensis, Dichapetalum deflexum, Grewia forbesii, G. lepidopetala, Gymnosporia mossambicensis, Hilsenbergii petiolaris, Holarrhena pubescens, Ochna barbosae, Paropsia braunii, Pavetta gracillima, Strychnos henningsii, Suregada zanzibariensis, Tarenna junodii, and *Turraea wakefieldii,*

Climbers in the thicket include *Ancylobotrys petersiana, Apodostigma pallens, Artabotrys brachypetalus, A. monteiroae, Hugonia orientalis, Landolphia kirkii, Marsdenia macrantha, Monodora junodii* var. *junodii, Strychnos panganensis*, and *Rhoicissus revoilii*. Soft shrubs and herbaceous species recorded are *Ecbolium clarkei* var. *puberulum, Gonatopus boivinii, Justicia stachytarphetoides*, *Triaspis suffulta* and the orchid *Oeceoclades maculata*.

Abiotic environment and climate

Altitude range of 10 to 80 m asl with a mean of 41 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 65.3% while the similarly measured clay content is 22.1%. Soil pH is 6.1.

Precipitation during driest quarter is 47.5 mm.



Species of Conservation Importance

Endemic Plant Species

While no plant species are known to be endemic to this unit, the following are species endemic or near-endemic to Inhambane Province: *Bauhinia burrowsii*, *Carissa praetermissa, Croton aceroides, Croton inhambanensis,* and *Ozoroa gomesiana*.

Threatened Plant Species

Bauhinia burrowsii [EN], *Croton aceroides* [EN], *Croton inhambanensis* [VU], *Ozoroa gomesiana* [VU].

Photographic credits Pande Sand Thicket near Inhassoro, Inhambane Province. photo: W. McCleland.

RLE Assessment

Assessment Summary	Assessment Information
This ecosystem has a restricted geographic distribution but there is little evidence of ongoing declines in extent. However, moderate to high degradation levels are present across almost the entire distribution of the ecosystem. **Vulnerable**	**Criterion A:** Expansion of urban areas, agriculture & deforestation has caused a 25.15% decline since 1750. Least Concern **Criterion B:** This ecosystem has an AOO of 28 10 x 10 km grid cells and an EOO of 2295.28 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern **Criterion C:** Not evaluated **Criterion D:** Degradation assessment shows that 42.47% of the current distribution faces >90 percent degradation severity, 72.3% of the distribution faces >70 percent degradation severity, and 89.67% of the distribution faces >50 percent degradation severity. Vulnerable **Criterion E:** Not evaluated

SAVE VALLEY CHALK THICKET

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Brenha em calcário do val do Save

Biome Tropical-subtropical forests (T1)

Functional group Tropical-subtropical dry forests and thickets (T1.2)

Regional Ecosystem Southern African Dry Thicket

Description

Short thicket about 4 m high with some emergent trees up to 9 m, with a high diversity of woody species. Occurring in an undulating landscape composed of low hillocks and incised by various non-perennial (ephemeral) streams. Thicket occurs on shallow, dark brown clay loam underlain by calcrete that frequently outcrops. The underlying geology is Tertiary deposits comprised of yellow-grey calcareous (calcium carbonate) arenites.

Distribution

Limited to Mozambique, along the banks of the lower course of the Save River, in Inhambane and Sofala Provinces.

Characteristic native biota

Trees make up around 10%; shrubs greater than 1 m tall about 85%; grass sward sparse at around 3%.

Terminalia boivinii, which is diagnostic, and *Spirostachys africana* are the dominant trees. Other common and conspicuous trees include *Afzelia quanzensis, Berchemia zeyheri* (a diagnostic and interesting range extension), *Brachylaena huillensis, Carpodiptera africana, Cleistochlamys kirkii, Combretum apiculatum, C. hereroense, C. imberbe, C. molle, Drypetes mossambicensis, Euphorbia tirucalli, Guibourtia conjugata* (scattered only*), Lannea schweinfurthii, Mimusops obtusifolia, Pappea capensis, Ptaeroxylon obliquum, Pteleopsis myrtifolia, Sclerocarya birrea* subsp. *caffra, Sideroxylon inerme, Terminalia stuhlmannii,* and *Ziziphus mucronata.*

Common and conspicuous shrubs include *Bauhinia burrowsii, Bourreria nemoralis, Carissa tetramera, Combretum celastroides, C. elaeagnoides, Commiphora africana, C. schlechteri, Croton madandensis, C. gratissimus, C. steenkampianus, Dichrostachys cinerea, Ehretia amoena, Euclea natalensis, Erythroxylum emarginatum, Euphorbia ambroseae* var. *spinosa* (diagnostic), *Grewia gracillima, G. inaequilatera, Gymnosporia maranguensis, G. pubescens, G. senegalensis, Margaritaria discoidea, Olax dissitiflora, Ozoroa obovata, Pavetta uniflora, Phyllanthus reticulatus, Searsia gueinzii, S. refracta, Senna petersiana, Suregada zanzibariensis, Terminalia prunioides, Tinnea rhodesiana, Tricalysia delagoensis, Turraea nilotica, Thilachium africanum,* and *Uvaria gracilipes*.

Climbers/scramblers recorded are *Ancylobotrys petersiana, Artabotrys brachypetalus, Cissus rotundifolia, C. quadrangularis, Distephanus divaricatus, Jasminum fluminense, Landolphia kirkii, Loeseneriella crenata, Rhoicissus revoilii, Secamone parvifolia,* and *Uvaria gracilipes*.

The understory is quite sparsely vegetated but includes species such as *Barleria elegans*, *B. spinulosa,* and *Justicia stachytarphetoides*.

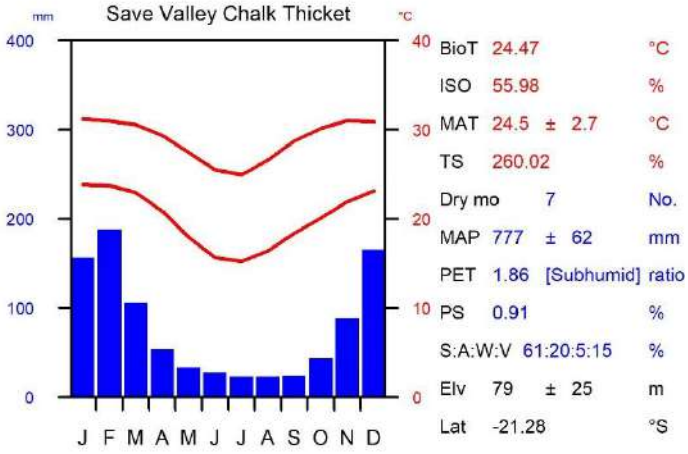
Other communities

Tall Closed Woodland/Forest occurs along ephemeral streams with deeply incised channels. Common and conspicuous species include *Acacia nigrescens, Carpodiptera africana, Diospyros mespiliformis, Strychnos potatorum*, and *Tamarindus indica*.

Abiotic environment and climate

Altitude range of 30 to 140 m asl with a mean of 79 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 58.4% while the similarly measured clay content is 26.5%. Soil pH is 6.2.

Precipitation during driest quarter is 35.6 mm.



Species of Conservation Importance

Endemic Plant Species

Euphorbia ambroseae var. *spinosa* [NE], *Vepris myrei* [NE].

Threatened Plant Species

Brachylaena huillensis [NT], *Vepris myrei* [EN].

Biogeographic Anomalies

Searsia refracta, or possibly a new species to be separated out from typical material from the Eastern Cape, is recorded here and also found on the Cheringoma Plateau limestones north of Beira.

Photographic credits *Terminalia boivinii* dominated thicket in the Save Valley; photos: W. McCleland.

RLE Assessment

Assessment Summary	Assessment Information
This ecosystem has a restricted geographic distribution but there is little evidence of ongoing declines in extent. However, moderate degradation levels are present across almost the entire distribution of the ecosystem. **Vulnerable**	**Criterion A:** Expansion of urban areas, agriculture & deforestation has caused a 2.94% decline since 1750. Least Concern **Criterion B:** This ecosystem has an AOO of 25 10 x 10 km grid cells and an EOO of 2351.6 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern **Criterion C:** Not evaluated **Criterion D:** Degradation assessment shows that 0.94% of the current distribution faces >90 percent degradation severity, 7.93% of the distribution faces >70 percent degradation severity, and 91.84% of the distribution faces >50 percent degradation severity. Vulnerable **Criterion E:** Not evaluated

ZAMBEZIAN SAND THICKET

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Brenha arenosa do Zambeze
Biome Tropical-subtropical forests (T1)
Functional group Tropical-subtropical dry forests and thickets (T1.2)
Regional Ecosystem Southern African Dry Thicket

Description

Dense wooded bushland to thicket 6-8 m high on raised sandy ridges, typically dominated by the family Combretaceae.

Distribution

Occurring in western part of Mozambique's Zambezi valley, Tete Province; also into Zimbabwe and Zambia.

Characteristic native biota

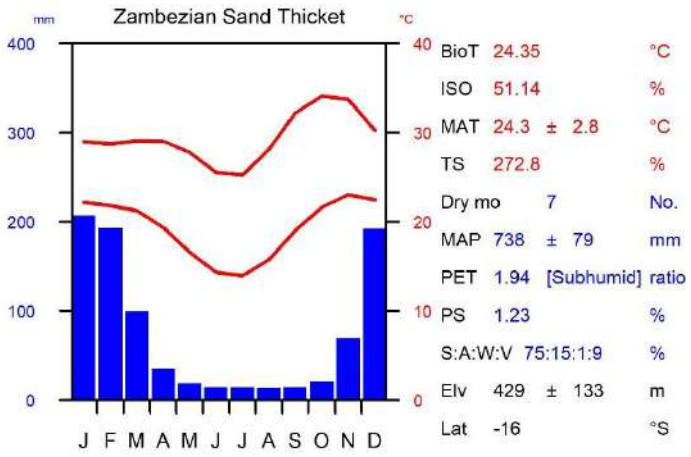
Short dense woodland or wooded bushland characterised by trees of *Terminalia brachystemma* with 30-50% cover. The main emergent trees (to 8 m) are *Kirkia acuminata, Xeroderris stuhlmannii* and *Colophospermum mopane*. Other typical tree species include *Combretum collinum, C. apiculatum, Commiphora caerulea, C. karibensis, C. merkeri, C. pyracanthoides, Meiostemon tetandrus,* and *Schrebera trichoclada*. A well-developed shrub layer or thicket, consists of *Acacia ataxacantha, A. eriocarpa, Baphia massaiensis, Combretum celastroides, C. elaeagnoides, C. obovatum, C. padoides* and *Maerua kirkii*. The grass layer typically comprises *Heteropogon melanocarpus, Panicum maximum, Digitaria* spp. and *Schmidtia pappophoroides*. These woodlands are found on slightly elevated areas of unconsolidated, medium-textured brownish sands, possibly remnants of old colluvium or wind-blown Kalahari sand. This type grades into *Xylia dry forest* (Zambezi Valley Sand Forest) in places, perhaps on deeper sands.

On Comboio plateau, the vegetation on top consists of a relatively dense woodland type (c. 60-80% cover), to 12 m, dominated by *Julbernardia globiflora* and *Terminalia brachystemma*. Associated trees species are *Combretum apiculatum, Combretum zeyheri, Commiphora mollis, Crossopteryx febrifuga, Diplorhynchus condylocarpon, Kirkia acuminata, Pseudolachnostylis maprouneifolia, Strychnos madagascariensis* and *Xeroderris stuhlmannii*. The shrub layer is relatively sparse. It comprises small individuals of the above species, together with *Boscia mossambicensis, Commiphora mossambicensis, Dalbergia melanoxylon, Dichrostachys cinerea, Friesodielsia obovata, Holarrhena pubescens, Markhamia obtusifolia, Pterocarpus brenanii, Solanum campylacanthum* and *Vangueria infausta*. Ground cover is very sparse (< 5%). Comboio also has a thicker, virtually closed canopy formation, including emergent species such as *Adansonia digitata* and *Kirkia acuminata*. The other type is localised patches of a low, dense, and mono-specific shrub community (perhaps *Diplorhynchus condylocarpon*) associated with slight depressions in the landscape.

Abiotic environment and climate

Altitude range of 60 to 750 m asl with a mean of 429 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 61.5% while the similarly measured clay content is 24.8%. Soil pH is 6.4.

Precipitation during driest quarter is 2.6 mm.



Species of Conservation Importance

Biogeographic Anomalies

Acacia eriocarpa, Combretum obovatum, and *Meiostemon tetandrus* are typical components of Zambezi Sand Thicket and are restricted in Mozambique to the upper Zambezi valley and mainly to this unit.

RLE Assessment

Assessment Summary

This ecosystem is relatively widespread and there is little evidence of declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 11.96% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 56 10 x 10 km grid cells and an EOO of 26014.26 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.24% of the current distribution faces >90 percent degradation severity, 1.78% of the distribution faces >70 percent degradation severity, and 14.84% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

LIMPOPO-OLIFANTS RIVERINE FOREST

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Floresta ribeirinha do Limpopo-Elefantes
Biome Tropical-subtropical forests (T1)
Functional group Tropical-subtropical dry forests and thickets (T1.2)
Regional Ecosystem Subtropical Riparian Forest

Description

A discontinuous or intermittent ribbon of fringing forest along the Limpopo and Olifants rivers, mostly evergreen (*Faidherbia* is deciduous in summer) on deep alluvial clays or sands.

Distribution

Southern Mozambique and extending into adjacent South Africa along the Olifants, Crocodile and Limpopo River valleys. Occurring in Gaza and Maputo Provinces.

Characteristic native biota

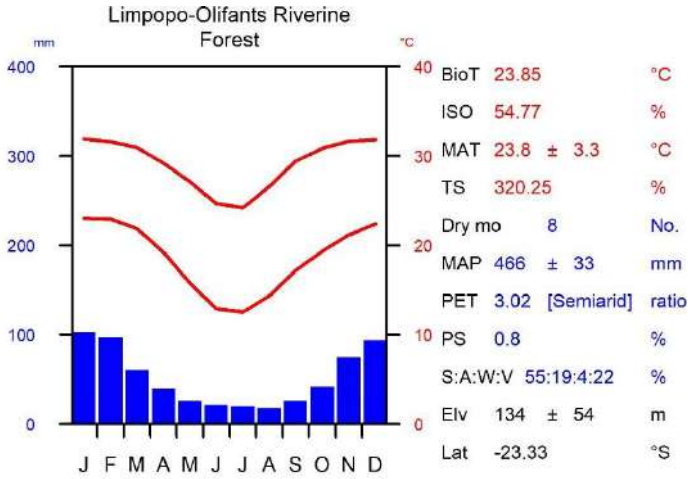
The typical trees are *Acacia robusta* var. *clavigera, A. xanthophloea, Albizia versicolor, Breonadia salicina, Bridelia micrantha, Combretum imberbe, Cordyla africana, Diospyros mespiliformis, Erythrophleum suaveolens, Faidherbia albida, Ficus sycomorus* subsp. *sycomorus, Kigelia africana, Philenoptera violacea, Schotia brachypetala, Sideroxylon inerme*, and *Xanthocercis zambesiaca*. Within this forest are frequently the climbers and lianes *Capparis fascicularis, C. tomentosa, Dalbergia armata, D. obovata, Entada rheedii, Grewia caffra*, and *Pisonia aculeata*. The palms *Hyphaene coriacea* and *Phoenix reclinata* are also strongly associated with riparian fringes.

Smaller trees and shrubs associated with this riverine vegetation are *Acacia schweinfurthii* var. *schweinfurthii, Alchornea laxiflora, Asystasia gangetica, Combretum microphyllum, C. mossambicensis, Croton madandensis, C. megalobotrys, Flueggea virosa, Gymnosporia senegalensis, Jasminum fluminense, Maclura africana, Phyllanthus reticulatus, Pluchea bojeri, Sesbania leptocarpa* var. *leptocarpa, S. sesban* var. *nubica,* and *Zanthoxylum humile.*

Abiotic environment and climate

Altitude range of 45 to 235 m asl with a mean of 134 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 56.1% while the similarly measured clay content is 26.2%. Soil pH is 6.6.

Precipitation during driest quarter is 20.2 mm.



Species of Conservation Importance: none recorded.

Photographic credits *top*: Olifants River, Limpopo National Park, Maputo Province. photo: M. Stalmans; *bottom*: *Acacia xanthophloea* forest near Pafuri, Limpopo River, Limpopo National Park, Maputo Province. photo: J. Burrows.

RLE Assessment

Assessment Summary

This ecosystem is relatively widespread and there is little evidence of declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 16.51% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 28 10 x 10 km grid cells and an EOO of 38071.51 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.61% of the current distribution faces >90 percent degradation severity, 4.04% of the distribution faces >70 percent degradation severity, and 43.1% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

MAPUTO RIVERINE FOREST

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Floresta ribeirinnha de Maputo

Biome Tropical-subtropical forests (T1)

Functional group Tropical-subtropical dry forests and thickets (T1.2)

Regional Ecosystem Subtropical Riparian Forest

Description

Open to closed tall riparian forest along large drainage lines and some river-fed pans.

Distribution

South of Maputo, Maputo Province, extending from South Africa and eSwatini into Mozambique along large rivers.

Characteristic native biota

An extensive vegetation type and very well-collected, typically dominated by the genus *Acacia* (*A. robusta* var. *clavigera, A. schweinfurthii* var. *schweinfurthii, A. senegal* var. *rostrata, A. welwitschii* subsp. *delagoensis, A. xanthophloea*) and *Ficus sycomorus* subsp. *sycomorus*. Other trees recorded are *Albizia adianthifolia, A. anthelmintica, A. petersiana* subsp. *evansii, Breonadia salicina, Bridelia micrantha, Combretum imberbe, Cordyla africana, Diospyros mespiliformis, Elaeodendron schlechterianum, Erythrophleum suaveolens, Faidherbia albida, Ficus bubu, F. lutea, F. polita* subsp. *polita, F. sansibarica* subsp. *sansibarica, F. stuhlmannii, Kigelia africana, Lannea schweinfurthii, Maerua angolensis, Mimusops obtusifolia, Morus mesozygia, Philenoptera violacea, Shirakiopsis elliptica, Sideroxylon inerme, Spirostachys africana, Syzygium cordatum, Trichilia emetica* subsp. *emetica, Voacanga thouarsii, Xanthocercis zambesiaca,* and *Ziziphus mauritiana.* The palms *Hyphaene coriacea* and *Phoenix reclinata* are widespread, while the near-endemic *Raphia australis* occurs in this vegetation type near Maputo.

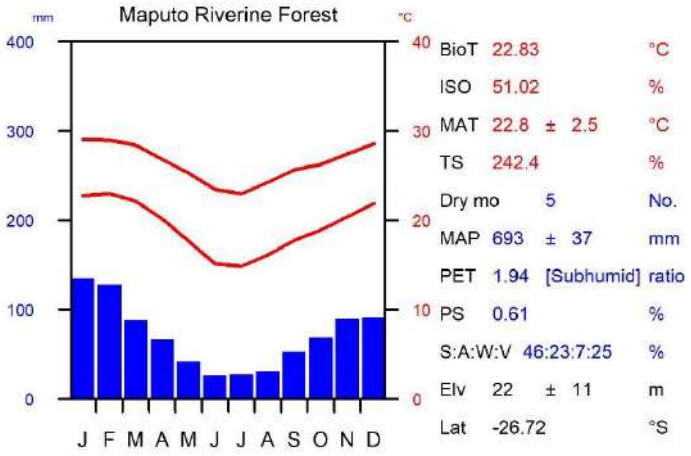
Small trees and shrubs recorded are *Acokanthera oppositifolia, Alchornea laxiflora, Balanites pedicellaris, Bridelia cathartica* subsp. *cathartica, Carissa bispinosa* subsp. *bispinosa, Combretum microphyllum, Croton madandensis, C. megalobotrys, Dichrostachys cinerea* subsp. *africana, Dichrostachys cinerea* subsp. *argillicola* var. *hirtipes, D. africana* subsp. *nyassana, Euclea divinorum, Ficus capreifolia, Flueggea virosa, Gymnosporia senegalensis, Jasminum fluminense, Lycium schizocalyx, Maclura africana, Maerua juncea* subsp. *crustata, Oncoba spinosa, Phyllanthus reticulatus, Salvadora angustifolia, S. persica, Schotia capitata, Sesbania leptocarpa* var. *leptocarpa, S. sesban* var. *nubica, Thilachium africanum, Ximenia caffra* var. *natalensis,* and *Zanthoxylum humile.*

As the rivers near the coast, before the tidal zone, species such as *Barringtonia racemosa*, *Ficus trichopod*a and *Hibiscus tiliaceus* occur in the riverine fringe.

Abiotic environment and climate

Altitude range of 8 to 45 m asl with a mean of 22 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 51.5% while the similarly measured clay content is 29.5%. Soil pH is 5.9.

Precipitation during driest quarter is 48.9 mm.



Species of Conservation Importance: none recorded.

Photographic credits *top*: Tembe River, Porto Henrique, Maputo Province. photo: M. Lotter; *bottom*: Maputo River, Maputo Province. photo: J. Burrows.

RLE Assessment

Assessment Summary

This ecosystem has a restricted geographic distribution but there is little evidence of ongoing declines in extent. However, moderate degradation levels are present across almost the entire distribution of the ecosystem. **Vulnerable**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 3.87% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 1 10 x 10 km grid cells and an EOO of 1387.5 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0% of the current distribution faces >90 percent degradation severity, 11.82% of the distribution faces >70 percent degradation severity, and 97.51% of the distribution faces >50 percent degradation severity. Vulnerable

Criterion E: Not evaluated

SAVE RIVERINE FOREST

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Floresta ribeirinha do Rovuma
Biome Tropical-subtropical forests (T1)
Functional group Tropical-subtropical dry forests and thickets (T1.2)
Regional Ecosystem Subtropical Riparian Forest

Description

Open to closed tall riparian forest.

Distribution

Extending from Zimbabwe down along the large rivers in the Save River Catchment area. Also including Buzi River systems. Occurring in Gaza, Inhambane, Manica and Sofala Provinces.

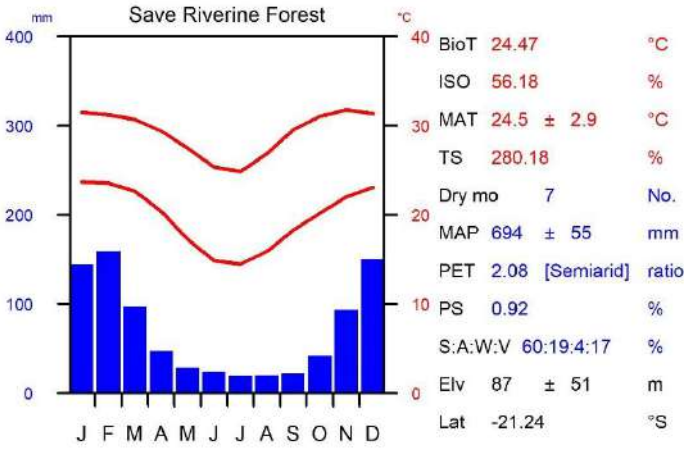
Characteristic native biota

The riparian forest along the Save River is typically composed *of Acacia xanthophloea, A. robusta* subsp. *clavigera, Albizia glaberrima, A. versicolor, Ficus sycomorus* subsp. *sycomorus, Kigelia africana, Berchemia discolor, Cordyla africana, Combretum imberbe, Pappea capensis, Diospyros mespiliformis, Euphorbia tirucalli, Faidherbia albida, Newtonia hildebrandtii* var. *pubescens, Philenoptera violacea, Hyphaene coriacea, Drypetes mosambicensis, Phoenix reclinata, Spirostachys africana, Sterculia appendiculata, Xanthocercis zambesiaca,* and *Xeroderris stuhlmannii*. Smaller understorey trees and shrubs typically consist of *Azima tetracantha, Capparis tomentosa, Croton megalobotrys, Deinbollia xanthocarpa, Grewia bicolor, G. caffra, Gymnosporia senegalensis, Diospyros loureiriana, Lecaniodiscus fraxinifolius, Mystroxylon aethiopicum, Rinorea elliptica, Thilachium africanum* and *Tricalysia jasminiflora.*

Abiotic environment and climate

Altitude range of 10 to 220 m asl with a mean of 87 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 59.3% while the similarly measured clay content is 23.5%. Soil pH is 6.2.

Precipitation during driest quarter is 24 mm.



Species of Conservation Importance: none recorded.

Photographic credits *left & right*: Save River, Zinave National Park, Inhambane Province. photos: M. Stalmans.

RLE Assessment

Assessment Summary

This ecosystem is relatively widespread and there is little evidence of declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 14.96% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 24 10 x 10 km grid cells and an EOO of 12147.59 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0% of the current distribution faces >90 percent degradation severity, 1.47% of the distribution faces >70 percent degradation severity, and 28.83% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

LURIO RIVERINE FOREST

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Floresta ribeirinha do Lúrio

Biome Tropical-subtropical forests (T1)

Functional group Tropical-subtropical dry forests and thickets (T1.2)

Regional Ecosystem Tropical Riparian Forest

Description

Open or closed tall forest occurring along the larger river courses in the Lurio River catchment.

Distribution

Confined to Mozambique, along Lurio River and its major tributaries in Cabo Delgado, Nampula, Niassa and Zambezia Provinces.

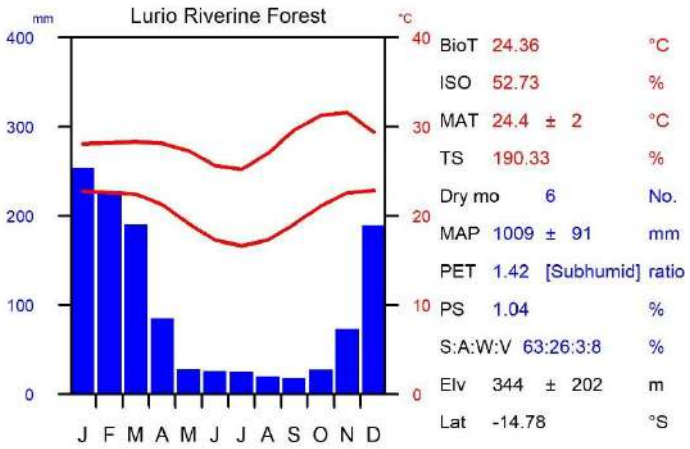
Characteristic native biota

Riverine forest is composed typically of *Acacia polyacantha* subsp. *campylacantha, A. robusta* subsp. *usambarensis, Albizia glaberrima* subsp. *glabrescens, A. versicolor, Combretum imberbe, Cordyla africana, Diospyros mespiliformis, Ficus sycomorus* subsp. *sycomorus, Khaya anthotheca, Sterculia appendiculata, Tamarindus indica, Trichilia emetica,* and *Zanha golungensis*, with shrubs and climbers such as *Bauhinia galpinii*, *Burnatia enneandra*, *Capparis tomentosa*, *Combretum microphyllum, Dalbergia arbutifolia*, *D. fischeri, Deinbollia borbonica, Ficus verruculosa, Lagenaria sphaerica, Mimosa pigra, Physostigma mesoponticum, Psophocarpus palustris, Saba comorensis, Sesbania bispinosa*, and *Tiliacora funifera.*

Abiotic environment and climate

Altitude range of 7 to 660 m asl with a mean of 344 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 61.2% while the similarly measured clay content is 21.8%. Soil pH is 6.0.

Precipitation during driest quarter is 17.2 mm.



Species of Conservation Importance: none recorded.

Photographic credits *Parkia filicoidea* in riverine forest near Monapo, Nampula Province. photo: M. Lotter

RLE Assessment

Assessment Summary

This ecosystem has a restricted geographic distribution but there is little evidence of ongoing declines in extent. However, moderate degradation levels are present across almost the entire distribution of the ecosystem. **Vulnerable**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 11.68% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 0 10 x 10 km grid cells (cells require >1% coverage to be counted – see methods) and an EOO of 72134.45 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 16.63% of the current distribution faces >90 percent degradation severity, 33.26% of the distribution faces >70 percent degradation severity, and 83.14% of the distribution faces >50 percent degradation severity. Vulnerable

Criterion E: Not evaluated

ROVUMA RIVERINE FOREST

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Floresta ribeirinha do Rovuma
Biome Tropical-subtropical forests (T1)
Functional group Tropical-subtropical dry forests and thickets (T1.2)
Regional Ecosystem Tropical Riparian Forest

Description

Open to closed riparian forest along the large rivers within the Rovuma River catchment. A poorly sampled and little-known unit.

Distribution

The Rovuma River catchment but including Tanzania side, Cabo Delgado and Niassa Provinces.

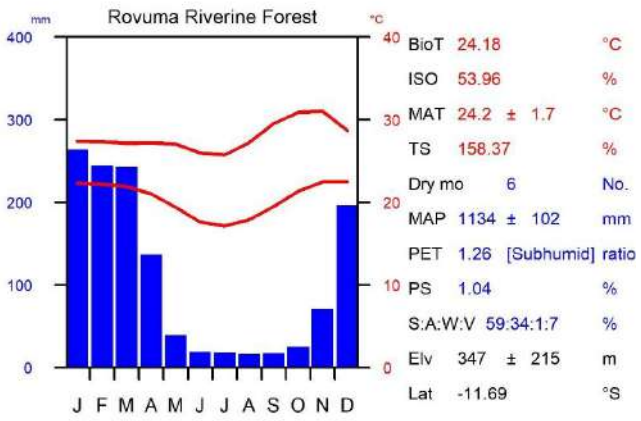
Characteristic native biota

The riverbank vegetation along the Rovuma River is composed of the trees *Albizia glaberrima* var. *glabrescens, Barringtonia racemosa, Faidherbia albida, Ficus sycomorus* subsp. *sycomorus, Kigelia africana, Lepisanthes senegalensis* and *Syzygium niassense*, with shrubby vegetation composed of *Phyllanthus reticulatus, Ficus capreifolia, Mimosa pigra, Persicaria madagascariensis* and *Phragmites mauritiana* with climbers such as *Luffa cylindrica*. The floating aquatic *Pistia stratiotes* is common.

Abiotic environment and climate

Altitude range of 20 to 610 m asl with a mean of 347 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 57.0% while the similarly measured clay content is 25.6%. Soil pH is 6.0.

Precipitation during driest quarter is 12.9 mm.



Species of Conservation Importance

Endemic Plant Species

Syzygium niassense [NE].

Photographic credits *left*: *Syzygium niassense* on the bank of a Rovuma River channel. photo: M. Lotter; *right*: junction of Rovuma R. & Nthumbwe R., Cabo Delgado Province. phto: J. Burrows.

RLE Assessment

Assessment Summary

This ecosystem has a restricted geographic distribution but there is little evidence of ongoing declines in extent. However, moderate degradation levels are present across almost the entire distribution of the ecosystem. **Vulnerable**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 13.17% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 4 10 x 10 km grid cells and an EOO of 71494.45 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 2.52% of the current distribution faces >90 percent degradation severity, 18.64% of the distribution faces >70 percent degradation severity, and 83.61% of the distribution faces >50 percent degradation severity. Vulnerable

Criterion E: Not evaluated

ZAMBEZI RIVERINE FOREST

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Floresta ribeirinha do Zambeze
Biome Tropical-subtropical forests (T1)
Functional group Tropical-subtropical dry forests and thickets (T1.2)
Regional Ecosystem Tropical Riparian Forest

Description

Closed to open tall riparian forest along the Zambezi River and its tributaries. Where best developed, the forest is made up of multiple layers comprising tall emergent trees up to 25 m, a tree layer at about 10-15 m, and a shrub layer to 3 m. In such cases the ground herbaceous layer remains poorly developed. Any thinning of the canopy is accompanied by a marked increase in the shrub and grass layers.

Distribution

From Zambia and Zimbabwe, along the Zambezi River and its major tributaries into Mozambique. Occurring in Sofala, Tete, and Zambezia Provinces.

Characteristic native biota

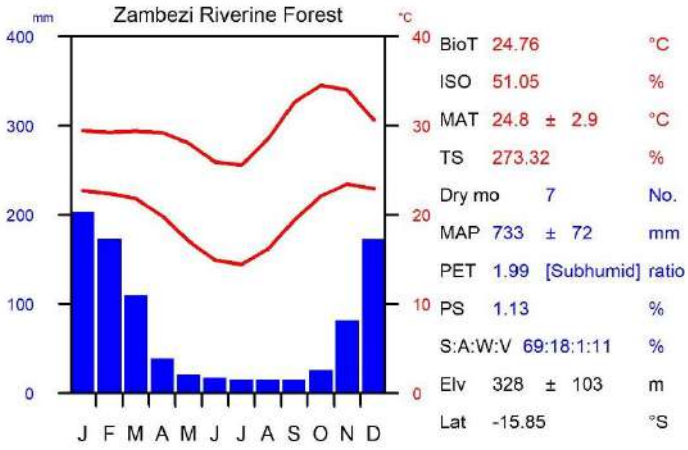
Species composition of the riparian forest is highly varied. Dominant tree species include *Ficus sycomorus* subsp. *sycomorus, Acacia robusta* subsp. *clavigera, A. tortilis, A. xanthophloea, Combretum imberbe, Faidherbia albida, Philenoptera violacea, Sterculia appendiculata, Tamarindus indica, Xanthocercis zambesiaca*, *and Ziziphus mauritianus* Other common trees are *Acacia nigrescens, Balanites maughamii, Berchemia discolor, Cordyla africana, Diospyros mespiliformis, Piliostigma thonningii*, and *Garcinia livingstonei*. The palm *Hyphaene petersiana* may also occur in the riverine fringe.

Typical shrub species include *Ficus capreifolia, Abrus* sp., *Acacia schweinfurthii, Allophylus rubifolius, Artabotrys brachypetalus, Capparis tomentosa, Cleistochlamys kirkii, Cordia pilosissima, Diospyros senensis, Friesodielsia obovata, Gymnosporia senegalensis, Lecaniodiscus fraxinifolius*, and *Maclura africana.*

Abiotic environment and climate

Altitude range of 5 to 460 m asl with a mean of 328 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 53.7% while the similarly measured clay content is 27.7%. Soil pH is 6.3.

Precipitation during driest quarter is 6 mm.



Species of Conservation Importance: none recorded.

Photographic credits *left*: north of Lake Urema, Sofala Province; photo: M. Stalmans; *right*: vegetation plot 56 in Gorongosa National Park. photo: M. Stalmans.

RLE Assessment

Assessment Summary

This ecosystem is relatively widespread and there is little evidence of declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 12.9% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 31 10 x 10 km grid cells and an EOO of 112903.18 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.09% of the current distribution faces >90 percent degradation severity, 2.16% of the distribution faces >70 percent degradation severity, and 27.59% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

T1.3 Tropical-subtropical montane rainforests

CENTRAL MONTANE FOREST

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Floresta montana do centro
Biome Tropical-subtropical forests (T1)
Functional group Tropical-subtropical montane rainforests (T1.3)
Regional Ecosystem Manica-Mulanje Mistbelt Forest

Description

Moist evergreen forest above ± 1600 m with a cool average annual temperature. Characteristic of the upland mountainous regions of Tsetserra, Serra Choa, and Mt Gorongosa in Manica and Sofala provinces.

Distribution

In the highlands of central Mozambique and adjacent Zimbabwe. Occurring in Manica and Sofala Provinces.

Characteristic native biota

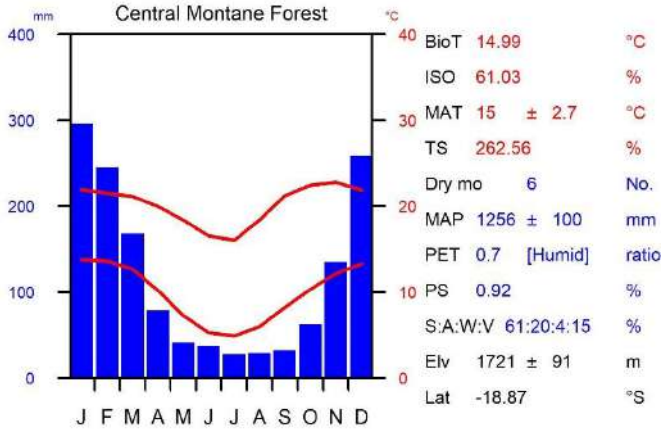
Dominated by species such as *Aphloia theiformis, Cassipourea gummiflua* var. *verticillata, C. malosana*, *Chionanthus foveolatus* subsp. *major, Cornus volkensii, Cryptocarya liebertiana, Curtisia dentata, Cussonia spicata, Dracaena steudneri, Faurea rubriflora, Ilex mitis, Macaranga mellifera, Neoboutonia melleri, Olea capensis* subsp. *hochstetteri, Pittosporum viridiflorum, Podocarpus mlanjianus, Polyscias fulva, Rapanea melanophloeos, Rothmannia urcelliformis, Schefflera goetzenii, Strombosia scheffleri, Syzygium afromontanum,* and *Xymalos monospora. Albizia gummifera* and *Maesa lanceolata* occur on forest margins and drainage lines.

Large shrubs include *Allophylus chaunostachys, Carissa bispinosa* subsp. *zambesiensis, Dovyalis lucida, Dracaena fragrans, Gerrardina eylesiana, Pavetta umtalensis, Peddiea africana, Psychotria zombamontana, Sclerochiton harveyanus,* and the climber *Urera hypselodendron*. The understorey is rich in species of the family *Rubiaceae.*

Abiotic environment and climate

Altitude range of 1600 to 2000 m asl with a mean of 1721 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 42.3% while the similarly measured clay content is 33.5%. Soil pH is 5.5.

Precipitation during driest quarter is 87 mm.



Species of Conservation Importance

Endemic Plant Species

Impatiens wuerstenii [E], *Polygala zambesiaca,* [NE, also in Zimbabwe], *Streptocarpus brachynema* [E], *Tephrosia praecana* [NE, also in Zimbabwe].

Threatened Plant Species

Impatiens wuerstenii [VU], *Polygala zambesiaca,* [VU], *Streptocarpus brachynema* [EN], *Tephrosia praecana* [VU].

Biogeographic Anomalies

Cornus volkensii is confined to this forest unit in Mozambique.

Photographic credits *top left*: upper slopes of Gorongosa, Sofala Province. photo: M. Lotter; *top right*: summit of Mt Gorongosa, Sofala Province. photo: J. Burrows; *bottom*: forest dominated by *Polyscias fulva*, Tsetserra, Manica Province. photo: J. Burrows

RLE Assessment

Assessment Summary

This ecosystem has a restricted geographic distribution but there is little evidence of ongoing declines in extent. However, moderate to high degradation levels are present across almost the entire distribution of the ecosystem. **Vulnerable**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 17.55% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 9 10 x 10 km grid cells and an EOO of 11215.38 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 32.55% of the current distribution faces >90 percent degradation severity, 47.79% of the distribution faces >70 percent degradation severity, and 98.78% of the distribution faces >50 percent degradation severity. Vulnerable

Criterion E: Not evaluated

CENTRAL SUBMONTANE FOREST

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Floresta submontana do centro
Biome Tropical-subtropical forests (T1)
Functional group Tropical-subtropical montane rainforests (T1.3)
Regional Ecosystem Manica-Mulanje Mistbelt Forest

Description

Moist evergreen forest between 1300 and 1600 m asl.

Distribution

In the highlands of central Mozambique and adjacent Zimbabwe. Occurring in Manica and Sofala Provinces.

Characteristic native biota

A mixture of species from montane forest above and the medium altitude forest below. In its upper parts, montane species are more prominent. Most typical and often dominant canopy species are *Cassipourea malosana, Chrysophyllum gorungosanum, Craibia brevicaudata, Macaranga mellifera* (a sign of past disturbance when dominant), *Olea capensis* subsp. *macrocarpa, Podocarpus latifolius, Strombosia scheffleri* and *Syzygium afromontanum*.

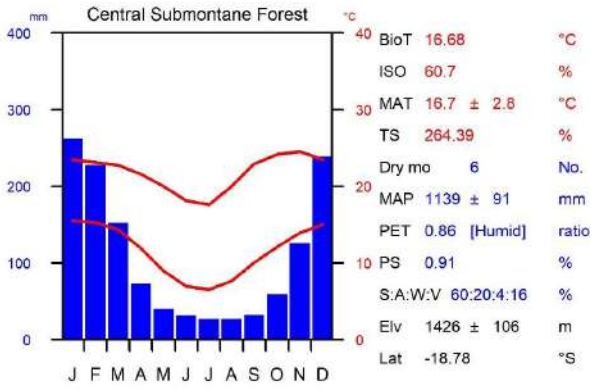
Other large but less frequent trees are *Albizia gummifera, Croton sylvaticus, Cryptocarya liebertiana, Diospyros abyssinica, Ekebergia capensis, Ficus chirindensis, F. craterostoma, F. scassellatii, Margaritaria discoidea* var. *nitida, Nuxia congesta* and *Pterocelastrus echinatus. Ocotea kenyensis* is rarely found. The most common sub-canopy species are *Tabernaemontana stapfiana* along with *Ochna arborea*; other typical sub-canopy trees are *Allocassine laurifolia, Canthium oligocarpum* subsp. *angustifolium, Carissa bispinosa* subsp. *zambesiensis, Chionanthus foveolatus subsp. major, Cola greenwayi, Dombeya burgessiae, Dracaena steudneri, Drypetes gerrardii, Englerophytum magalismontanum, Erythroxylum emarginatum, Excoecaria madagascariensis, Garcinia kingaensis, Heinsenia diervilleoides, Maytenus acuminata, Ochna holstii, Oxyanthus speciosus, Rawsonia lucida, Rothmannia urcelliformis, Vangueria esculenta, Vepris bachmannii* and *Xymalos monospora*. The shrub layer is normally distinct and includes *Carissa bispinosa* subsp. *zambesiensis, Erythrococca polyandra, Gymnosporia mossambicensis, Pauridiantha symplocoides, Pavetta comostyla, Peddiea africana, Psychotria zombamontana, Suregada procera,* and *Tarenna pavettoides*.

Additional typical and sometimes common shrubs are *Achyrospermum carvalhi, Alchornea hirtella, Coffea salvatrix, Diospyros abyssinica, Justicia betonica, Lasianthus kilimandscharicus, Piper capense* and *Rytigynia macrura. Dracaena fragrans* is common below 1450 m. In the herb layer *Acanthopale pubescens, Brachystephanus africanus* and *Isoglossa mossambicensis* are locally common, often forming extensive dense patches. The commonest lianas are *Keetia gueinzii, Schefflera goetzenii* and *Urera hypselodendron*. The most frequent grass species were *Coelachne africana, Isachne mauritiana* and *Poecilostachys oplismenoides.*

Abiotic environment and climate

Altitude range of 1280 to 1600 m asl with a mean of 1426 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 42.6% while the similarly measured clay content is 34.0%. Soil pH is 5.5.

Precipitation during driest quarter is 85 mm.



Species of Conservation Importance

Endemic Plant Species

Encephalartos manikensis [NE], *Justicia subcordatifolia* [NE], *Streptocarpus brachynema* [E].

Threatened Plant Species

*Encephalartos manikensis** [VU], *Streptocarpus brachynema* [EN], *Tannodia swynnertonii* [VU].

* may occur within forest but more often on bare adjacent rock faces.

Photographic credits *left*: forest on Mt Gorongosa, Sofala Province. photo. M. Stalmans; *right*: lower slopes of Gorongosa mountain. photo: M. Lotter.

RLE Assessment

Assessment Summary

This ecosystem has a restricted geographic distribution but there is little evidence of ongoing declines in extent. However, moderate to high degradation levels are present across most of the distribution of the ecosystem. **Vulnerable**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 19.97% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 25 10 x 10 km grid cells and an EOO of 18009.37 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 46.8% of the current distribution faces >90 percent degradation severity, 66.54% of the distribution faces >70 percent degradation severity, and 100% of the distribution faces >50 percent degradation severity. Vulnerable

Criterion E: Not evaluated

NORTHERN MONTANE FOREST

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Floresta montana do norte
Biome Tropical-subtropical forests (T1)
Functional group Tropical-subtropical montane rainforests (T1.3)
Regional Ecosystem Manica-Mulanje Mistbelt Forest

Description

Moist evergreen forest at high altitudes, 1600 to 2200 m. Closed canopy at around 20–25 m high, with emergents to 30-40 m. On steeper slopes the canopy is lower at 15–20 m with emergents to 25 m. Epiphytes and ferns are common. Trees can be tall, but not many of large girth. Stem density is high.

Distribution

Limited to the high mountains of Nampula and Zambezia Provinces, Mozambique, and adjacent Malawi. In Mozambique the largest area of this forest is on Mt Namuli.

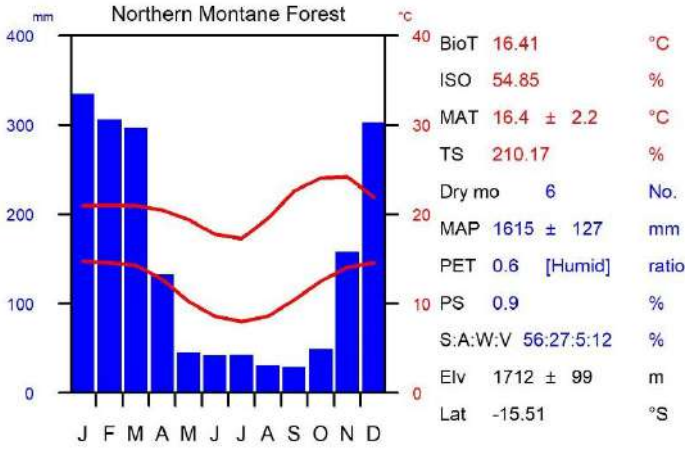
Characteristic native biota

Main emergent trees are *Cryptocarya liebertiana, Ekebergia capensis, Faurea wentzeliana,* and *Olea capensis* subsp. *hochstetteri*. Additional canopy trees include *Albizia gummifera, Anthocleista grandiflora, Aphloia theiformis, Apodytes dimidiata, Bersama abyssinica, Cassipourea malosana, Cussonia spicata, Drypetes gerrardii, Eugenia natalitia, Garcinia kingaensis* (common), *Ilex mitis, Macaranga capensis, Maytenus acuminata, Podocarpus milanjianus, Polyscias fulva, Prunus africana, Psydrax parviflora* subsp. *parviflora, Rapanea melanophloeos, Schefflera umbellifera* and *Tabernaemontana stapfiana*. Below 1700 m *Chrysophyllum gorungosanum* appears, with *Myrianthus holstii* in the understorey. Understorey trees and woody shrubs include: *Alchornea hirtella* (common), *Allophylus chaunostachys, Canthium oligocarpum* subsp. *captum, Carissa bispinosa* subsp. *zambesiensis, Chassalia parvifolia, Diospyros natalensis, Dracaena laxissima, Erythroxylum emarginatum, Ixora scheffleri, Lasianthus kilimandscharicus* (very common), *Mimulopsis solmsii, Mostuea brunonis, Ochna holstii, Oxyanthus speciosus, Pauridiantha paucinervis, Peddiea africana, Psychotria zombamontana, Rawsonia lucida, Rytigynia uhligii, Tricalysia* sp. and *Xymalos monospora*. Large woody lianas are characterised by *Schefflera goetzenii*, and *Rutidea orientalis* is also very common. Perhaps the commonest plant in the herb layer is *Anisotes pubinervis.* The fern flora is diverse, both in terrestrial and epiphytic species. On Namuli plateau at 1850–1900 m there are many small forest patches with canopy at around 15–20 m and emergents to 20–25 m which contain secondary species, including from forest margins - *Aphloia theiformis, Maesa lanceolata, Peddiea africana* and *Morella serrata*. Other common emergent trees include *Cassipourea malosana*, *Cryptocarya liebertiana*, *Ekebergia capensis*, *Faurea racemosa*, *Macaranga capensis, Olea capensis* subsp. *hochstetteri,* and *Nuxia congesta,* as well as *Podocarpus milanjianus, Prunus africana, Rapanea melanophloeos, Schefflera umbellifera, Syzygium cordatum* and *S. afromontanum*. Close to streams *Ilex mitis* is common.

Abiotic environment and climate

Altitude range of 1600 to 2200 m asl with a mean of 1712 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 49.2% while the similarly measured clay content is 28.8%. Soil pH is 5.3.

Precipitation during driest quarter is 72.4 mm.



Species of Conservation Importance

Endemic Plant Species

Agelanthus patelii [E*], *Faurea racemosa* [NE], *Impatiens psychadelphoides* [NE], *Isoglossa namuliensis* [E*], *Justicia* sp. A. [NE], *Memecylon nubigenum* [NE], *Pavetta chapmanii* [NE], *Pavetta gurueensis* [NE], *Plectranthus mandalensis* [NE*].

Threatened Plant Species

Agelanthus patelii [EN*], *Faurea racemosa* [EN], *Impatiens psychadelphoides* [VU], *Isoglossa namuliensis* [CR*], *Memecylon nubigenum* [EN], *Pavetta chapmanii* [VU], *Pavetta gurueensis* [VU], *Plectranthus mandalensis* [VU*], *Stachys didymantha* [VU].

Biogeographic Anomalies

Antrophyum mannianum (Pteridaceae) is a fern of Equatorial Africa, known only from Namuli within Mozambique and the *Flora Zambesiaca* region. It grows on mossy rocks in montane forest.

Photographic credits left & right: Northern Afromontane Forest, Mt Namuli, Zambezia Province. photos: J. Timberlake.

RLE Assessment

Assessment Summary

This ecosystem has a restricted geographic distribution but there is little evidence of ongoing declines in extent. However, moderate to high degradation levels are present across most of the distribution of the ecosystem. **Vulnerable**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 10.25% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 4 10 x 10 km grid cells and an EOO of 3761.79 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 36.72% of the current distribution faces >90 percent degradation severity, 63.86% of the distribution faces >70 percent degradation severity, and 99.38% of the distribution faces >50 percent degradation severity. Vulnerable

Criterion E: Not evaluated

NORTHERN SUBMONTANE FOREST

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Floresta submontana do norte
Biome Tropical-subtropical forests (T1)
Functional group Tropical-subtropical montane rainforests (T1.3)
Regional Ecosystem Manica-Mulanje Mistbelt Forest

Description

Moist evergreen forest at medium to high altitudes, 1300 to 1600 m.

Distribution

Limited to the high mountains north of the Zambezi River in Mozambique, in the Nampula, Niasa, and Zambezia Provinces. Also in adjacent Malawi. In Mozambique the largest area of this forest is on Mt Mabu.

Characteristic native biota

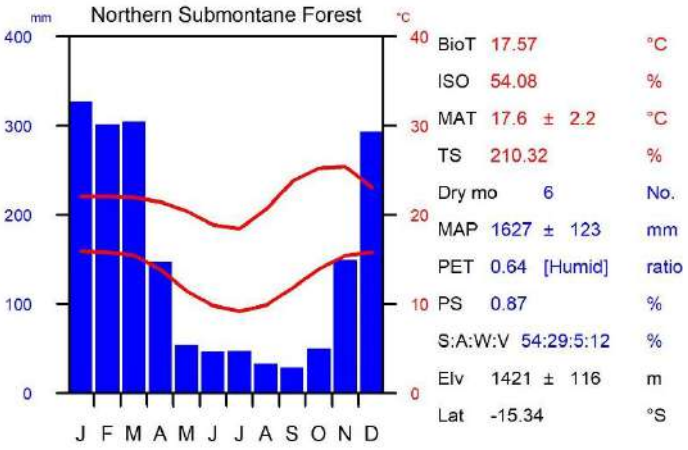
Change from medium-altitude to high altitude forest is fairly abrupt in dropping out of *Newtonia buchananii*, the replacement of *Albizia adianthifolia* by *A. gummifera*, and by *Olea capensis* subsp. *hochstetteri* becoming a conspicuous tall tree. Canopy trees in lower parts include *Chrysophyllum gorungosanum, Maranthes goetzeniana, Newtonia buchananii*, and *Strombosia scheffleri,* with *Cola greenwayi, Garcinia kingaensis, Heinsenia diervilleoides, Myrianthus holstii, Tabernaemontana stapfiana* and *Vepris nobilis* in the sub-canopy. Small *Cassipourea malosana* and the understorey tree *Lasiodiscus pervillei* appear around 1300 m, while *Maytenus acuminata* and *Eugenia natalitia* are common between 1300–1400 m. Higher up *Podocarpus milanjianus* becomes increasingly common. *Anthocleista grandiflora* and *Polyscias fulva* are found in openings or gaps. At upper end at 1600 m, taller trees (25 m) are *Olea capensis* subsp. *hochstetteri* and *Rapanea melanophloeos*, with shorter trees of *Aphloia theiformis, Bersama abyssinica, Mystroxylon aethiopicum* subsp. *schlechteri, Cassipourea malosana, Cryptocarya liebertiana, Faurea racemosa, Macaranga capensis, Nuxia congesta, Ochna holstii, Pittosporum viridiflorum, Podocarpus milanjianus, Polyscias fulva, Prunus africana* and *Syzygium afromontanum*.

Conspicuous lianas include *Rutidea orientalis, Schefflera goetzeni*i and *Keetia gueinzii*. At elevations of 1550−1600 m, the small understorey trees and shrubs include *Carissa bispinosa* subsp. *zambeziensis, Chassalia parvifolia, Anisotes pubinervius, Diospyros abyssinica, D. whyteana, Dovyalis macrocalyx, Dracaena laxissima, Erythroxylum emarginatum, Eugenia natalitia, Lasianthus kilimandscharicus, Maytenus acuminata, Mostuea brunonis, Pavetta gurueënsis, Canthium oligocarpum* subsp. *captum, Rinorea angustifolia* subsp. *ardisiiflora, Rytigynia uhligii, Tricalysia acocantheroides, Memecylon nubigenum,* and *Vepris nobilis*.

Abiotic environment and climate

Altitude range of 1300 to 1600 m asl with a mean of 1421 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 46.3% while the similarly measured clay content is 33.4%. Soil pH is 5.3.

Precipitation during driest quarter is 80.5 mm.



Species of Conservation Importance

Endemic Plant Species

Encephalartos gratus [NE], *Crotonogynopsis australis* [NE], *Memecylon nubigenum* [NE], *Polysphaeria harrisii* [NE], *Pyrostria chapmanii* [E], *Sclerochiton hirsutus* [NE], *Streptocarpus leptopus* [NE*], *Streptocarpus milanjianus* [NE*], *Streptocarpus myoporoides* [E].

Threatened Plant Species

Encephalartos gratus [VU], *Faurea racemosa* [EN], *Helixanthera schizocalyx* [EN], *Memecylon nubigenum* [EN], *Pavetta chapmanii* [VU], *Pavetta gurueensis* [VU], *Polysphaeria harrisii* [EN], *Pyrostria chapmanii* [EN], *Sclerochiton hirsutus* [VU], *Streptocarpus leptopus* [EN*], *Streptocarpus milanjianus* [VU*], *Streptocarpus myoporoides* [EN].

Biogeographic Anomalies

Two species of fig, *Ficus modesta* (one record) and *F. cyathistipula* (two records) are both collected from this vegetation unit and are the only records from Mozambique.

Photographic credits *left & right:* Northern Submontane Forest on Mt Mabu, Zambezia Province. photos: J. Timberlake.

RLE Assessment

Assessment Summary

This ecosystem has a restricted geographic distribution but there is little evidence of ongoing declines in extent. However, moderate to high degradation levels are present across most of the distribution of the ecosystem. **Vulnerable**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused an 8.9% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 14 10 x 10 km grid cells and an EOO of 85585.08 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 16.11% of the current distribution faces >90 percent degradation severity, 37.93% of the distribution faces >70 percent degradation severity, and 99.86% of the distribution faces >50 percent degradation severity. Vulnerable

Criterion E: Not evaluated

3.1.1.2 Biome: T3 Shrublands & shrubby woodlands

T3.1 Seasonally dry tropical shrublands

NORTHERN INSELBERG WOODLAND

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Mata dos Inselberg do norte
Biome Shrublands & shrubby woodlands (T3)
Functional group Seasonally dry tropical shrublands (T3.1)
Regional Ecosystem Ecosystem Zambezian Inselberg Woodland

Description

A rather sparsely vegetated deciduous woodland, with a more prominent shrub layer, on shallow soils on granite inselberg mountains. The herbaceous layer may be quite succulent as the communities derive little moisture from the soils. Inselberg forest may become established between inselbergs but larger patches from the far northern parts of Mozambique have been mapped as a distinct forest type, Northern Lowland Inselberg Forest. However it does occur in smaller unmappable patches within this vegetation type. One of the richest environments in Mozambique for endemic plants.

Distribution

Mostly confined to large inselbergs throughout Mozambique, north of the Zambezi River. Occurring in Cabo Delgado, Nampula Niassa, and Zambezia Provinces.

Characteristic native biota

On ± level shelves or platforms supporting shallow soils occur trees that survive on shallow soils that are seasonally arid, such as, typically, *Afzelia quanzensis, Albizia tanganyicensis, Brachystegia microphylla, B. torrei* and sometimes *B. spiciformis, B. bussei, Commiphora africana* var. *africana, C. fulvotomentosa, C. serrata, C. zanzibarica, Schrebera trichoclada, Sterculia quinqueloba*, and *Sterculia africana*. Smaller trees and shrubs include *Allophylus torrei, Carvalhoa campanulata, Clerodendrum myricoides, Cola discoglypremnophylla, Coptosperma supra-axillare, Croton pseudopulchellus, Dracaena mannii, D. reflexa, Haplocoelum* sp., *Heinsia crinita, Hymenodictyon parvifolium, Mundulea sericea, Pavetta micropunctata, Pouzolzia mixta, Rotheca makanjanum, R. sansibarensis* subsp. *sansibarensis* var. *eratensis, Rothmannia fischeri* subsp. *moramballae, Rytigynia torrei, Searsia acuminatissima, Steganotaenia araliacea, Strophanthus hypoleucus, Tapiphyllum burnettii, Tricalysia schliebenii, Uvariodendron* sp., *with climbers Dalbergia bracteolata, Entada chrysostachys* and herbaceous species such as *Cyphostemma subciliatum* and *Drimia intricata*.

Trees and shrubs that can grow on bare rock or very thin soils are mainly figs (*Ficus abutilifolia, F. glumosa, F. ingens*), *Aloe mawii, Aloe chabaudii, Aloe torrei*, *Asparagus procera* SM Burrows, ined., and particularly *Euphorbia,* many of which are endemic to these inselbergs: *Euphorbia contorta, E. cooperi, E. corniculata*, *E. decliviticola*, *E. grandicornis* subsp. *sejuncta, E. griseola* subsp. *mashonica, E. marrupana*, *E. matabelensis, E. mlanjeana*, *E. namulensis, E. ramulosa*, *E. stenocaulis, E. tirucalli, E.* (*Monadenium*) *torrei, E. unicornis, Xerophyta pseudopinifolia, X. scabrida, and X. suaveolens* var. *vestita*, and *Strophanthus hypoleucus.* Small climbers in this zone include *Adenia*

mossambicensis, Asparagus buchananii, A. petersianus, and *Sarcostemma viminale*. The cycad *Encephalartos turneri* is widespread across many of these northern inselbergs.

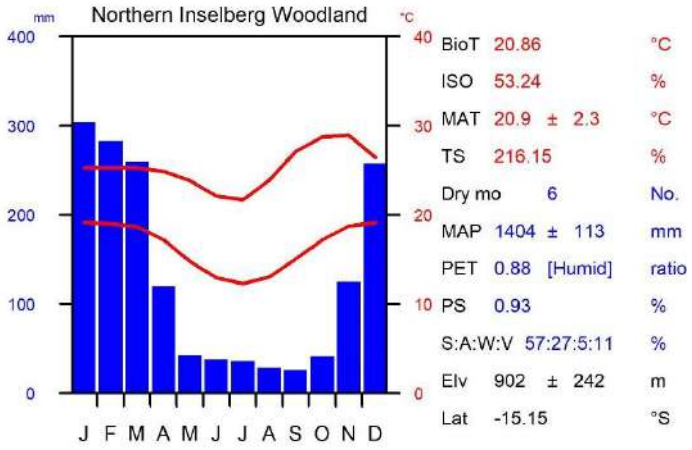
Some herbaceous species here are *Eulophia petersii, Kalanchoe elizae*, *Kalanchoe hametiorum*, *K. humilis, Myrothamnus flabellifolius, Plectranthus cucullatus*, *P. gracilis, P. sanguineus,* as well as the orchids *Cyrtorchis glaucifolia* and *Polystachya dendrobiiflora* (both growing on *Xerophyta* spp.). The sedges *Coleochloa pallidior* and *C. setifera* are diagnostic of these expanses of rock, while the monotypic grass *Baptorhachis foliacea* is known only from this habitat. Drought-resistant pteridophytes particularly associated with these inselbergs are *Actiniopteris dimorpha, Asplenium stuhlmannii, Cheilanthes leachii, C. viridis* var. *glauca, C. welwitschii, Mohria lepigera, Pellaea calomelanos* var. *calomelanos, P. pectiniformis*, and *Selaginella njamnjamensis.*

The shallow mats of humic, peaty soils that overly flat sheetrock, or surrounding seasonally wet depressions support herbaceous species such as *Aeollanthus buchnerianus, A. serpiculoides, Aristida diminuta, Bulbostylis burchellii, Drosera indica, Eriocaulon transvaalicum subsp. hanningtonii, Eriospermum spp., Hionanthera torrei*, *Lindernia exilis, Oldenlandia verrucitesta, Ophioglossum costatum, O. gomezianum, O. rubellum, Utricularia formula,* and *Xyris rubella*.

Abiotic environment and climate

Altitude range of 405 to 1657 m asl with a mean of 902 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 55.7% while the similarly measured clay content is 27.6%. Soil pH is 5.7.

Precipitation during driest quarter is 51.6 mm.



Species of Conservation Importance

Endemic Plant Species

Adenia mossambicensis [E], *Allophylus torrei* [E], *Aloe ribauensis* [E], *Aloe rulkensii* [E*], *Aloe torrei* [E], *Alloeochaete namuliensis* [E], *Ammannia parvula* [E], *Asparagus procerus* SM Burrows & J.E.Burrows, ined. [E], *Asystasia malawiana* [E], *Baptorhachis foliacea* [E], *Ceropegia nutans* [E], *Cissus aristolochiifolia* [NE*], *Coleus namuliensis* [E], *Crassula zombensis* [NE], *Cynanchum oresbium* [E], *Cyrtorchis glaucifolia* [E], *Digitaria appropinquata* [E], *Digitaria megasthenes* [E], *Dissotis johnstoniana* var. *johnstoniana* [NE], *Dombeya lastii* [E], *Dombeya leachii* [E], *Encephalartos turneri* [E], *Euphorbia contorta* [E], *Euphorbia corniculata* [E], *Euphorbia decliviticola* [NE], *Euphorbia grandicornis* subsp. *sejuncta* [E], *Euphorbia marrupana* [E], *Euphorbia mlanjeana* [NE], *Euphorbia namuliensis* [E], *Euphorbia ramulosa* [E], *Euphorbia stenocaulis* [E], *Euphorbia* (*Monadenium*) *torrei* [E], *Euphorbia unicornis* [E], *Helichrysum lastii* [NE], *Gymnosporia gurueensis* [E], *Hionanthera torrei* [E], *Huernia erectiloba* [E], *Indigofera pseudomoniliformis* [E], *Justicia attenuifolia* [NE], *Kalanchoe elizae* [NE], *Kalanchoe hametiorum* [E], *Lobelia blantyrensis* [NE], *Oldenlandia verrucitesta* [E], *Pavetta micropunctata* [NE],*Pavetta* sp. J of Burrows *et al.* (2018) [E], *Pimpinella mulanjensis* [NE], *Plectranthus cucullatus* [E*], *Polystachya songaniensis* [NE], *Rhynchosia torrei* [E], *Rotheca sansibarensis* subsp. *sansibarensis* var. *eratensis* [E], *Rytigynia* sp. c of FZ. [E], *Rytigynia torrei* [E], *Senecio peltophorus* [NE], *Stomatostemma pendulina* [E], *Streptocarpus myoporoides* [E], *Tephrosia whyteana* subsp. *gemina* [E*], *Xerophyta pseudopinifolia* [NE], *Xerophyta splendens* [NE].

Threatened Plant Species

Allophylus torrei [EN], *Aloe ribauensis* [EN], *Aloe rulkensii* [CR*], *Aloe torrei* [DD], *Alloeochaete namuliensis* [VU], *Ammannia parvula* [VU], *Baptorhachis foliacea* [DD], *Cissus aristolochiifolia* [VU*],*Cynanchum oresbium* [VU], *Cyrtorchis glaucifolia* [EN], *Digitaria appropinquata* [DD], *Digitaria megasthenes* [EN], *Dombeya lastii* [EN], *Dombeya leachii* [EN], *Euphorbia grandicornis* subsp.*sejuncta* [EN], *Euphorbia marrupana* [EN], *Gymnosporia gurueensis* [EN], *Indigofera pseudomoniliformis* [VU], *Plectranthus cucullatus* [VU*], *Stomatostemma pendulina* [VU], *Streptocarpus myoporoides* [EN], *Tephrosia whyteana* subsp. *gemina* [CR*].

Photographic credits *Top*: landscape with inselbergs, Cabo Delgado Province. photo: J. Burrows; *bottom left*: between Marrupa and the Lugenda River, Niassa Province. photo: M. Lotter; *bottom right*: woodland on shelf at at base of inselberg, Taratibu, Ancuabe District, Cabo Delgado Province. photo: J. Burrows.

RLE Assessment

Assessment Summary	Assessment Information
This ecosystem is relatively widespread and there is little evidence of declines in extent or degradation. **Least Concern**	**Criterion A:** Expansion of urban areas, agriculture & deforestation has caused a 37.2% decline since 1750. Least Concern **Criterion B:** This ecosystem has an AOO of 432 10 x 10 km grid cells and an EOO of 214940.83 km2. Least Concern **Criterion C:** Not evaluated **Criterion D:** Degradation assessment shows that 22.74% of the current distribution faces >90 percent degradation severity, 53.86% of the distribution faces >70 percent degradation severity, and 87.26% of the distribution faces >50 percent degradation severity. Least Concern **Criterion E:** Not evaluated

SOUTHERN INSELBERG WOODLAND

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Mata dos Inselberg do sul
Biome Shrublands & shrubby woodlands (T3)
Functional group Seasonally dry tropical shrublands (T3.1)
Regional Ecosystem Ecosystem Zambezian Inselberg Woodland

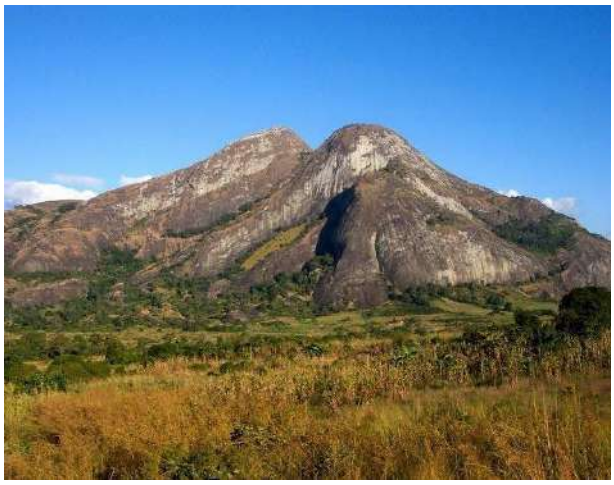
Description

Sparse deciduous dry woodland with a prominent shrub layer, occurring on large granite inselberg mountains.

Distribution

Occurring on large inselbergs in central Mozambique, south of the Zambezi River, in Manica and Sofala Provinces. Also in adjacent Zimbabwe.

Characteristic native biota



The following woody species form a seasonally dry forest or woodland in deeper soils in ravines or shoulders of inselbergs, or around their base where water runoff provides ample moisture whenever rainfalls. Trees and shrubs include *Afzelia quanzensis, Albizia versicolor, Brachystegia glaucescens, B. microphylla, B. utilis, Bersama abyssinica* subsp. *abyssinica, Cassipourea euryoides, Commiphora africana, Commiphora zanzibarica, Cordyla africana, Diospyros ferrea, D. squarrosa, Euclea natalensis* subsp. *acutifolia, Ficus bubu, F. natalensis* subsp. *natalensis, Garcinia buchananii, Hymenodictyon floribundum, Millettia usaramensis* subsp. *australis, M. stuhlmannii, Rothmannia fischeri* subsp. *moramballae, Schrebera alata, Searsia chirindensis, Sterculia appendiculata, S. quinqueloba*, and *Trichilia emetica.*

Shrubs and small trees include *Acalypha chirindica, Artabotrys monteiroae, Bridelia mollis, Clutia swynnertonii, Coddia rudis, Coffea zanguebariae, Coptosperma neurophylla, C. supra-axillare, Grewia micrantha, Gymnosporia harveyana, G. mossambicensis, Heinsia crinita* subsp. *parviflora, Leptactina delagoensis* subsp. *delagoensis Monanthotaxis trichocarpa, Psychotria capensis* subsp. *capensis, Polysphaeria lanceolata* var. *pedata, Psychotria kirkii* var. *kirkii, Psydrax livida, Solanum tettense, Strophanthus petersianus, Tricalysia congesta* subsp. *chasei, T. junodii,* and *Vepris reflexa.*

Soft shrubs and herbaceous species include *Ceropegia leachiana, Crassula leachii, Geophila obvallata* subsp. *ioides, Hibiscus calyphyllus, Lantana swynnertonii, Laportea aestuans, Oplismenus burmanni, O. hirtellus, Plectranthus flaccidus, Sansevieria pedicellata, Vernoniastrum acuminatissimum.*

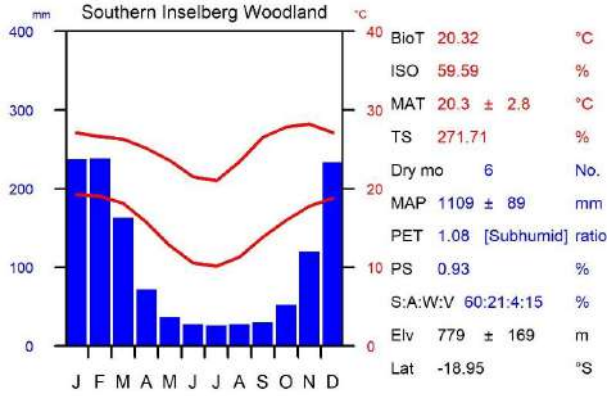
Climbers: *Bowiea volubilis, Dalbergia arbutifolia, D. fischeri, Dioscorea asteriscus, Ipomoea albivenia, Lagenaria sphaerica, Neonotonia wightii* subsp. *pseudojavanica, Paederia bojeriana* subsp. *foetens,* and *Tinospora tenera.*

Sheetrock communities: *Actiniopteris dimorpha, Aeollanthus serpiculoides, Aeschynomene nodulosa* var. *nodulosa, Aloe cameronii, A. cannellii, A. chabaudii* var. *chabaudii, A. decurva, Anisopappus kirkii, Cheilanthes viridis, Coleochloa setifera, Eriospermum triphyllum, Eulophia petersii, Euphorbia cooperi, E. graniticola, E. matabelensis, Ficus abutilifolia, F. glumosa, F. ingens, Huernia hislopii, Linderniella pulchella, Myrothamnus flabellifolius, Pellaea calomelanos, Pouzolzia mixta, Selaginella dregei, Tetradenia riparia,* and *Xerophyta spp.*

Abiotic environment and climate

Altitude range of 190 to 1170 m asl with a mean of 779m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 57.8% while the similarly measured clay content is 26.6%. Soil pH is 5.7.

Precipitation during driest quarter is 54.8 mm.



Species of Conservation Importance

Endemic Plant Species

Aloe decurva [E*], *Encephalartos manikensis* [NE], *Encephalartos munchii* [E*], *Encephalartos pterogonus* [E*].

Threatened Plant Species

Aloe decurva [CR*], *Encephalartos manikensis* [VU], *Encephalartos munchii* [CR*], *Encephalartos pterogonus* [CR*].

Biogeographic Anomalies

Euphorbia graniticola, Tricalysia congesta subsp. *chasei.*

Photographic credits *Top*, Mt Zembe, Manica Province. photo: M. Lotter; *bottom left and bottom right*: Inselbergs in Gorongosa National Park, Sofala Province. photos: Piotr Naskrecki.

RLE Assessment

Assessment Summary

This ecosystem has a restricted geographic distribution but there is little evidence of ongoing declines in extent. However, moderate to high degradation levels are present across most of the distribution of the ecosystem. **Vulnerable**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 27.29% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 46 10 x 10 km grid cells and an EOO of 20770.65 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 20.25% of the current distribution faces >90 percent degradation severity, 65.18% of the distribution faces >70 percent degradation severity, and 90.55% of the distribution faces >50 percent degradation severity. Vulnerable

Criterion E: Not evaluated

3.1.1.3 Biome: T4 Savannas and grasslands

T4.1 Trophic savannas

LEBOMBO SUMMIT SOURVELD

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Pradaria do cume dos Libombos
Biome Savannas and grasslands (T4)
Functional group Trophic savannas (T4.1)
Regional Ecosystem Lowveld Savanna

Description

Wooded grassland along the summit of the Lebombo Mountains at higher altitudes.

Distribution

Summit of the Lebombo mountains, Maputo Province, between the Eswatini border and Mbuzini in South Africa; also in Eswatini.

Characteristic native biota

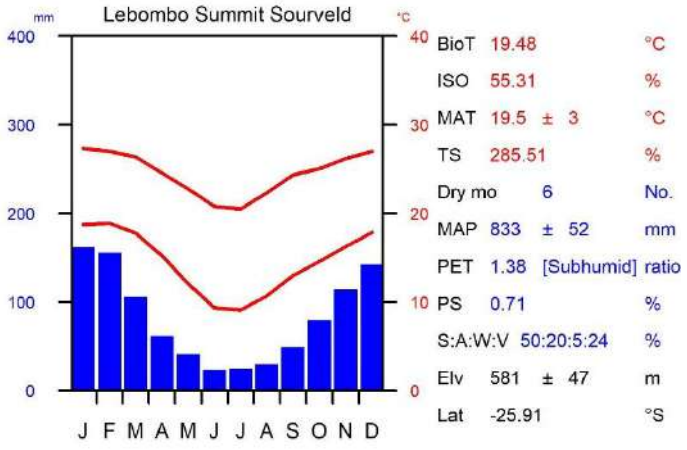
Trees include *Acacia burkei* (Lebombo form), *A. caffra, A. davyi, A. gerrardii, Dombeya rotundifolia,* and *Protea caffra* subsp. *caffra.* Shrubs include *Psoralea latifolia, Crotalaria natalitia, Diospyros dichrophylla, D. lycioides* subsp. *nitens,* and *Grewia monticola.*

The herbaceous layer includes *Andropogon gayanus, Argyrolobium adscendens, Aristida transvaalensis, Berkheya insignis, Brachiaria serrata, Crossandra greenstockii, Crabbea hirsuta, Cymbopogon caesius, Diospyros galpinii, Elionurus muticus, Eulophia parviflora, Gerbera ambigua, Gnidia caffra, Hilliardiella oligocephala, Hyparrhenia filipendula, Hyperthelia dissoluta, Indigofera hilaris, Ruellia cordata,* and *Themeda triandra.*

Abiotic environment and climate

Altitude range of 500 to 750 m asl with a mean of 581 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 36.9% while the similarly measured clay content is 38.4%. Soil pH is 6.0.

Precipitation during driest quarter is 66.4 mm.



Species of Conservation Importance: none recorded.

RLE Assessment

Assessment Summary

This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 32.27% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 4 10 x 10 km grid cells and an EOO of 116.62 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0% of the current distribution faces >90 percent degradation severity, 0.86% of the distribution faces >70 percent degradation severity, and 6.37% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

NORTHERN LEBOMBO BUSHVELD

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Pradaria arbustiva do norte dos Libombos

Biome Savannas and grasslands (T4)

Functional group Trophic savannas (T4.1)

Regional Ecosystem Lowveld Savanna

Description

Open deciduous woodland dominated by Combretaceae on rocky slopes and ridges along the northern parts of the Lebombo Mountains.

Distribution

In Mozambique and South Africa, from the Incomati River in the south, northwards to the Nuanedzi River. Occurring in Gaza and Maputo Provinces.

Characteristic native biota

The tree layer includes *Acacia erubescens, A. exuvialis, A. nigrescens, Adansonia digitata, Albizia harveyi, Boscia albitrunca, Colophospermum mopane, Combretum apiculatum, C. imberbe, C. molle, C. zeyheri, Commiphora mollis, Euphorbia confinalis, E. cooperi, E. tirucalli, Hymenodictyon austro-africanum, Kirkia acuminata, Lannea schweinfurthii* var. *stuhlmannii, Ozoroa engleri, Pappea capensis, Peltophorum africanum, Sterculia rogersii,* and *Sclerocarya birrea* subsp. *caffra. Colophospermum mopane* occurs in areas of deeper soil.

Shrubs include *Flueggea virosa, Grewia bicolor, Mundulea sericea, Pavetta catophylla, Portulacaria afra, Pouzolzia mixta,* and *Tricalysia junodii.*

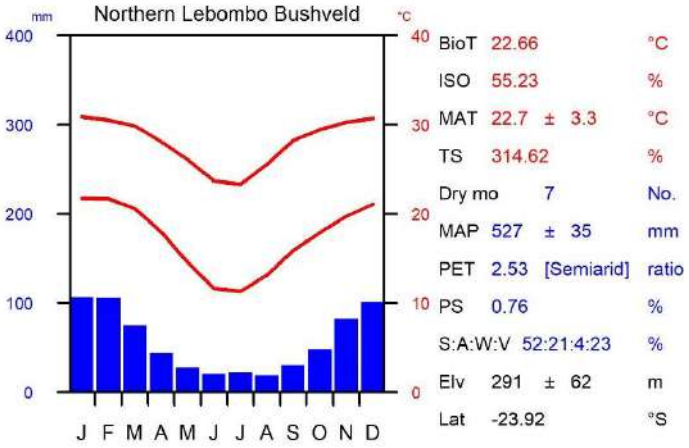
Herbaceous layer includes *Aloe chabaudii, Andropogon gayanus, Aristida congesta, Asparagus nodulosus, Brachiaria xantholeuca, Digitaria eriantha, Enneapogon cenchroides, Heteropogon contortus*, *Panicum maximum, Pogonarthria squarrosa, Sansevieria pearsonii* and *Setaria incrassata*.

Riverine fringes typically include the trees *Acacia xanthophloea, Combretum imberbe* and *Ficus sycomorus* supsp. *sycomorus*, the shrubs *Nuxia oppositifolia*, *Pluchea bojeri* and *Kanahia laniflora*, and the reed *Phragmites mauritianus*.

Abiotic environment and climate

Altitude range of 130 to 425 m asl with a mean of 291 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 52.1% while the similarly measured clay content is 29.7%. Soil pH is 6.8.

Precipitation during driest quarter is 25.3 mm.



Species of Conservation Importance

Endemic Plant Species

Hymenodictyon austro-africanum [NE].

Biogeographic Anomalies

Stadmannia oppositifolia subsp. *rhodesiaca.*

Photographic credits *left & right*: Lebombo Mts, Limpopo National Park, Maputo Province. photos: M. Stalmans.

RLE Assessment

Assessment Summary

This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 3.14% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 51 10 x 10 km grid cells and an EOO of 6736.72 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.06% of the current distribution faces >90 percent degradation severity, 0.28% of the distribution faces >70 percent degradation severity, and 11.03% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

SOUTHERN LEBOMBO BUSHVELD

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Pradaria arbustiva do sul dos Libombos
Biome Savannas and grasslands (T4)
Functional group Trophic savannas (T4.1)
Regional Ecosystem Lowveld Savanna

Description

Open or closed deciduous woodland dominated with Acacia and Combretum species.

Distribution

From Ressano Garcia, southwards along Lebombo Mountains (Maputo Province) into Swaziland. Also in South Africa.

Characteristic native biota

Trees that are characteristic of the mountain slopes of the Lebombo Mts, alphabetically arranged, are *Acacia burkei, A. caffra, A. davyi, A. goetzei, A. karroo, A. swazica, Albizia harveyi, A. versicolor, Aloe marlothii, Bolusanthus speciosus, Berchemia zeyheri, Combretum apiculatum, C. collinum, C. hereroense, C. molle, C. zeyheri, Dalbergia melanoxylon, Diospyros dichrophylla, Dombeya rotundifolia, Ehretia amoena, Euclea crispa, E. natalensis, E. schimperi, Euphorbia confinalis, E. ingens, E. keithii, Faurea saligna, Ficus abutilifolia, F. burkei, F. glumosa, F. ingens, F. salicifolia, Galpinia transvaalica, Grewia hexamita, Gymnosporia glaucophylla, Heteropyxis natalensis, Karomia speciosa, Lannea discolor, Mundulea sericea, Ozoroa engleri, O. paniculosa* var. *paniculosa, O. sphaerocarpa, Pavetta edentula, Peltophorum africanum, Premna mooiensis, Pterocarpus angolensis, P. rotundifolius* subsp. *rotundifolius, Searsia leptodictya, Schrebera alata, Strychnos madagascariensis, S. spinosa, Tabernaemontana elegans, Terminalia phanerophlebia, Vangueria infausta, V. madagascariensis, Vitex obovata* and *Ziziphus mucronata.*

Small trees and shrubs include *Bauhinia galpinii, Canthium armatum, Carissa bispinosa* var. *bispinosa, Coddia rudis, Croton gratissimus, Dichrostachys cinerea* subsp. *africana* and subsp. *nyassana, Erythroxylum delagoense, E. emarginatum, Flueggea virosa, Gardenia volkensii, Grewia bicolor, G. micrantha, Maerua rosmarinoides, Monanthotaxis caffra, Obetia tenax, Ochna natalitia, Olax dissitiflora, Ormocarpum trichocarpum, Pavetta gracilifolia, Searsia rogersii, Turraea obtusifolia, Uvaria lucida* subsp. *virens, Vepris reflexa, Vitex harveyana, Ximenia caffra* var. *natalensis,* and *X. americana* var. *microphylla.*

Softer shrubs, climbers and herbaceous species: *Adenia digitata, Aloe cryptopoda, A. spicata, A. vanbalenii, Asparagus falcatus, A. lynetteae, A. minutiflorus, Aspidoglossum araneiferum, Barleria obtusa, B. saxatilis, Capparis fasciculatus, Clematis brachiata, Crotalaria monteiroi* var. *galpinii, C. virgulata* subsp. *virgulata, Cyphostemma barbosae, C. schlechteri, Eriosema cordata, Euphorbia schlechteri, Gnidia chrysantha, Gymnema sylvestre, Heliotropium strigosum, Hibiscus barbosae, H. calyphyllus, H. meyeri, H. micranthus, Indigofera emarginella* var. *emarginella, Jatropha hirsuta, Kalanchoe rotundifolia, Kleinia fulgens, Monechma debile, Orbea carnosa* subsp. *keithii, Pachycarpus appendiculatus, Pachypodium saundersii, Raphionacme globosa, R. procumbens, Rhinacanthus rotundifolius, Rhynchosia albissima, R. genistoides, Sarcostemma viminale, Sphedamnocarpus pruriens* var. *pruriens, Stenostelma corniculatum, Tephrosia gobensis, T. noctiflora,* and *T. polystachya* var. *polystachya.*

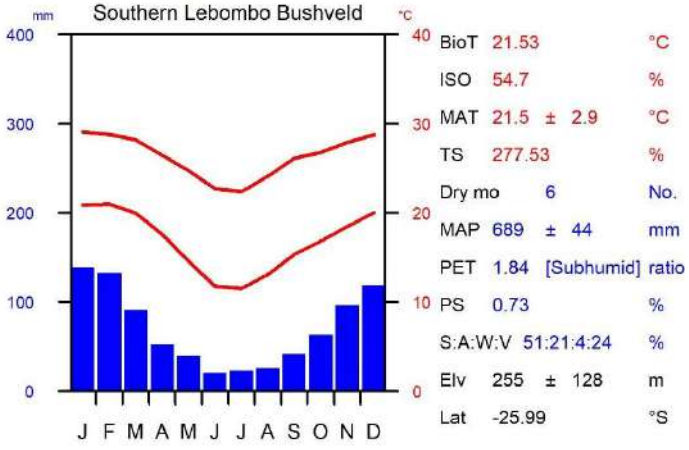
Riparian vegetation is mainly composed of *Acacia schweinfurthii, Breonadia salicina, Combretum imberbe, Cordyla africana, Diospyros mespiliformis, Ficus sycomorus* subsp. *sycomorus, Nuxia oppositifolia, Phoenix reclinata, Phyllanthus reticulatus, Schotia brachypetala, Sesbania sesban,* and *Syzygium cordatum.*

Grasses are numerous and include, among others, *Andropogon gayanus* var. *polycladus, A. schirensis, Aristida congesta* subsp. *barbicollis, A. stipitata* subsp. *graciliflora, Bewsia biflora, Bothriochloa insculpta, Brachiaria brizantha, B. dictyoneura, B. serrata, B. xantholeuca, Cenchrus ciliaris, Cymbopogon caesius, C. excavatus, Cynodon dactylon, Digitaria argyrograpta, Diplachne eleusine, Elionurus muticus, Enneapogon cenchroides, Eragrostis aspera, E. barbinodis, E. capensis, E. curvula, E. cylindriflora, E. heteromera, E. racemosa, E. superba, Eriochloa stapfiana, Eustachys paspaloides, Heteropogon contortus, Hyparrhenia dichroa, H. filipendula* var. *pilosa, Megastachya mucronata, Melinis repens, Panicum deustum, P. laticomum, P. maximum, P. subalbidum, Schizachyrium sanguineum, Setaria sphacelata, Sorghastrum stipoides, Sporobolus pyramidalis, Themeda triandra, Tragus berteronianus, Tricholaena monachne, Tripogon leptophyllus, Tristachya leucothrix,* and *Urochloa panicoides.*

Abiotic environment and climate

Altitude range of 55 to 530 m asl with a mean of 255 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 41.8% while the similarly measured clay content is 35.9%. Soil pH is 6.3.

Precipitation during driest quarter is 43.9 mm.



Species of Conservation Importance

Endemic Plant Species

Blepharis swaziensis [NE], *Ceropegia aloicola* [E*], *Encephalartos aplanatus* [NE], *Encephalartos lebomboensis* [NE*], *Encephalartos umbeluziensis* [NE], *Euphorbia keithii* [NE], *Jatropha latifolia* var. *subeglandulosa* [E], *Rhynchosia genistoides* [NE], *Thesium jeanae* [NE], *Triaspis hypericoides* subsp. *canescens* [NE].

Threatened Plant Species

Ceropegia aloicola [EN*], *Encephalartos lebomboensis* [EN*], *Encephalartos umbeluziensis* [EN], *Indigofera gobensis* [CR*], *Warburgia salutaris* [EN].

Biogeographic Anomalies

Encephalartos aplanatus, Encephalartos lebomboensis, Euphorbia keithii, Euphorbia schlechteri, Orbea carnosa subsp. *keithii, Pachypodium saundersii, Polystachya zuluensis*.

Photographic credits *left & right*: Lebombo Mts, Maputo Province. photos: M. Stalmans.

RLE Assessment

Assessment Summary	Assessment Information
This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**	**Criterion A:** Expansion of urban areas, agriculture & deforestation has caused a 11% decline since 1750. Least Concern **Criterion B:** This ecosystem has an AOO of 40 10 x 10 km grid cells and an EOO of 3347.2 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern **Criterion C:** Not evaluated **Criterion D:** Degradation assessment shows that 1.7% of the current distribution faces >90 percent degradation severity, 5.7% of the distribution faces >70 percent degradation severity, and 21.57% of the distribution faces >50 percent degradation severity. Least Concern **Criterion E:** Not evaluated

LIMPOPO LOWLAND WOODLAND

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Mata das terras baixas do Limpopo
Biome Savannas and grasslands (T4)
Functional group Trophic savannas (T4.1)
Regional Ecosystem Lowveld Savanna

Description

Open deciduous woodland dominated by *Acacia* species on clay to loamy or sandy soils.

Distribution

Limited to southern Mozambique, from Cubo in the north, through Chokwe to Maguaza. Occurring in Gaza and Maputo Provinces.

Characteristic native biota

The main trees are *Acacia nigrescens, A. nilotica, A. schweinfurthii* var. *schweinfurthii, A. senegal* var. *rostrata, A. tortilis, A. welwitschii, Adansonia digitata, Albizia petersiana* subsp. *evansii, A. anthelmintica, Balanites maughamii, Boscia mossambicensis, Combretum hereroense, C. imberbe, C. molle, Commiphora pyracanthoides, Euphorbia ingens, Manilkara mochisia, Ormocarpum trichocarpum, Peltophorum africanum, Sclerocarya birrea* subsp. *caffra, Searsia gueinzii, Spirostachys africana, Strychnos madagascariensis, Terminalia sericea,* and *Ziziphus mucronata.*

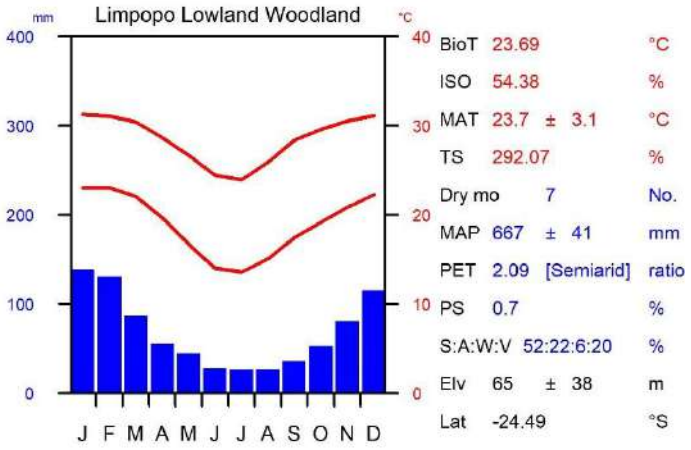
Shrubs and climbers include *Cadaba natalensis, Carissa bispinosa* subsp. *bispinosa, Cissus quadrangularis, Dichrostachys cinerea, Euclea divinorum, Gossypium herbaceum, Grewia bicolor, Gymnosporia senegalensis, Vepris carringtoniana, Salvadora persica, Sarcostemma viminale, Schotia capitata, Strophanthus gerrardii, Thilachium africanum, Ximenia americana* var. *microphylla,* and *Zanthoxylum humile.*

The herbaceous layer includes *Bothriochloa insculpta, Panicum coloratum, Panicum maximum, Sansevieria hyacinthoides, Setaria holstii,* and *Urochloa mossambicensis.*

Abiotic environment and climate

Altitude range of 15 to 200 m asl with a mean of 65 m. Soils have a thin sandy topsoil underlain by dark clay soils. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 59.8% while the similarly measured clay content is 24.1%. Soil pH is 6.5.

Precipitation during driest quarter is 44.6 mm.



Species of Conservation Importance

Endemic Plant Species

Acrotome mozambiquensis [E], *Chascanum schlechteri* var. *torrei* [E], *Dicliptera quintasii* [E], *Indigofera torrei* [NE].

Threatened Plant Species

Acrotome mozambiquensis [DD], *Dicliptera quintasii* [VU].

Photographic credit West of Macarretane, Maputo Province. photos: M. Lotter.

RLE Assessment

Assessment Summary

This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 33.96% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 192 10 x 10 km grid cells and an EOO of 22968.48 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.12% of the current distribution faces >90 percent degradation severity, 2.44% of the distribution faces >70 percent degradation severity, and 20.67% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

URRONGA LOWLAND DRY WOODLAND

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Mata seca das terras baixas do Urronga
Biome Savannas and grasslands (T4)
Functional group Trophic savannas (T4.1)
Regional Ecosystem Lowveld Savanna

Description

A mixed deciduous woodland usually dominated by *Acacia* species that may be quite open on clay flats.

Distribution

Limited to the Urrongas, between Massinga and Vilanculos, Inhambane Province.

Characteristic native biota

Trees include *Acacia gerrardii, A. nigrescens, A. robusta* var. *usambarensis* and var. *clavigera, A. schweinfurthii, A. sieberiana* var. *sieberiana, Adansonia digitata, Afzelia quanzensis, Albizia forbesii, A. versicolor, Balanites maughamii, Berchemia discolor, Bolusanthus speciosus, Brachystegia spiciformis, Cladostemon kirkii, Cleistochlamys kirkii, Combretum apiculatum, C. collinum, C. imberbe, C. hereroense, C. molle, Commiphora africana, C. pyracanthoides, C. schlechteri, C. viminea, Cordyla africana, Crossopteryx febrifuga, Diospyros mespiliformis, Dolichandrone alba, Drypetes arguta, D. mossambicensis, D. reticulata, Euclea natalensis* subsp. *natalensis, Ficus lingua, Kigelia africana, Gardenia volkensii, Guibourtia conjugata, Hyphaene coriacea, Julbernardia globiflora, Lannea schimperi, L. schweinfurthii, Manilkara mochisia, Millettia stuhlmannii, Newtonia hildebrandtii, Olax dissitiflora, Ozoroa obovata, Parinari curatellifolia, Philenoptera bussei, P. violacea, Piliostigma thonningii, Pseudolachnostylis maprouneifolia, Pterocarpus angolensis, Schinziophyton rautanenii, Sclerocarya birrea* subsp. *caffra, Securidaca longepedunculata, Spirostachys africana, Sterculia africana, Strychnos madagascariensis, S. potatorum, S. spinosa, Tamarindus indica, Terminalia sericea, Trichilia emetica, Xeroderris stuhlmannii, Xylia torreana,* and *Ziziphus mucronata.*

Small trees and woody shrubs recorded are *Abrus precatorius, Albertisia delagoensis, Allophylus mossambicensis, Annona senegalensis, Baphia massaiensis* subsp. *obovata, Bauhinia burrowsii, B. tomentosa, Brackenridgea zanguebarica, Bridelia cathartica, Carissa tetramera, Carpodiptera africana, Cassia afrofistula* var. *afrofistula, Combretum padoides, Coptosperma littorale, Croton aceroides, C. inhambanensis, C. madandensis, Dalbergia melanoxylon, Dichrostachys cinerea* subsp. *nyassana, Diospyros loureiriana, Dombeya kirkii, Dovyalis hispidula, Ehretia amoena, E. rigida* subsp. *nervifolia, Empogona allenii, E. junodii, Eugenia capensis, E. mossambicensis, Flacourtia indica, Grewia bicolor, G. sulcata, G. lepidopetala, G. forbesii, Hexalobus monopetalus* var. *obovatus, Maclura africana, Margaritaria discoidea, Markhamia zanzibarica, Monodora junodii* var. *junodii* and var. *macrantha, Mundulea sericea, Ormocarpum trichocarpum, Paropsia braunii, Phyllanthus reticulatus, Psydrax locuples, Schotia capitata, Searsia gueinzii, Senna petersiana, Solanum tettense* var. *renschii, Synaptolepis oliveriana, Tricalysia delagoensis, Turraea wakefieldii, Vangueria infausta,* and *Vitex ferruginea*.

Climbers: *Bonamia mossambicensis, Cocculus hirsutus, Distephanus divaricatus, Grewia caffra, Loeseneriella africana* var. *richardiana*, and *Marsdenia macrantha.* Epiphytes/parasites noted are *Acampe pachyglossa, Ansellia africana,* and *Tapinanthus forbesii.*

Soft shrubs and herbaceous species are *Agathisanthemum bojeri, Asparagus suaveolens, Aspilia mossambicensis, Barleria spinulosa, Blepharis acanthodioides, Chamaecrista mimosoides, Cienfuegosia hildebrandtii, Commelina*

forskaolii, Crinum stuhlmannii subsp. *delagoense, Crossandra mucronata, Crotalaria monteiroae, Droguetia ambigua, Eriosema psoraleoides, Eulophia schweinfurthii, Falkia oblonga, Gossypium herbaceum* subsp. *africanum, Hermannia glanduligera, Hibiscus engleri, Hybanthus enneaspermus, Indigofera charlieriana* subsp. *sessilis, I. delagoensis, Justicia flava, Kyphocarpa angustifolia, Lippia javanica, Melhania forbesii, Ruellia cordata, Siphonochilus kirkii, Tacca leontopetaloides, Tylosema fassoglense, Vigna vexillata, Zornia glochidiata,* and *Z. milneana.*

Grasses and sedges recorded from this vegetation type include *Andropogon schirensis, Brachiaria brizantha, Cenchrus ciliaris, Cymbopogon pospischilii, Digitaria milanjiana, Diheteropogon amplectens, Eragrostis chapelieri, E. inamoena, E. superba, Heteropogon contortus, Hyperthelia dissoluta, Panicum maximum, Perotis patens, Pogonarthria squarrosa, Sporobolus consimilis, S. pyramidalis, Urochloa mossambicensis*, and the sedge *Cyperus hemisphaericus.*

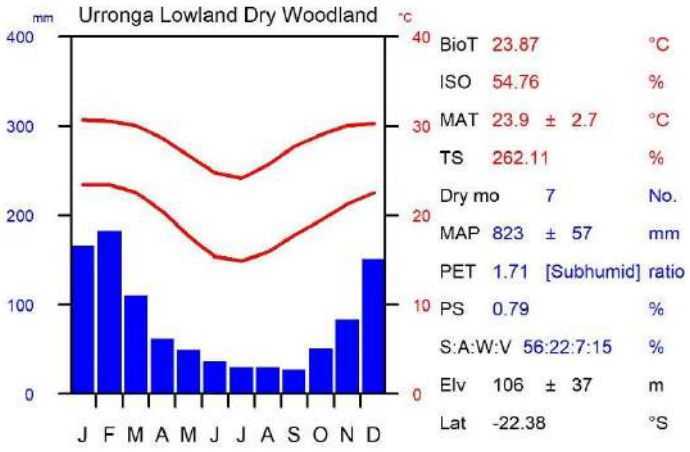
Patches of coastal forest and thicket are scattered within this vegetation type and are composed of, among others, *Albizia adianthifolia, Bligbia unijugata, Croton inhambanensis, Cussonia zimmermannii, Dialium schlechteri, Diospyros natalensis, Euclea racemosa* subsp. *sinuata, Hymenocardia ulmoides, Lasiodiscus pervillei* subsp. *pervillei, Manilkara discolor, Pteleopsis myrtifolia, Sideroxylon inerme, Strychnos decussata, Suregada procera, Tabernaemontana elegans, Xylotheca kraussiana,* and *Ziziphus pubescens.*

Small trees and woody shrubs of this forest community include *Acacia kraussiana, Alchornea laxiflora, Craibia zimmermannii, Dichapetalum deflexum, Hyperacanthus microphyllus, Kraussia floribunda, Pavetta gracilifolia, Pyrostria bibracteata, Sclerochiton apiculatus, Sphaerocoryne gracilis, Uvaria gracilipes, and U. lucida* subsp. *virens.* Creepers and lianes include *Ancylobotrys petersianus, Artabotrys brachypetalus, Asparagus falcatus, Dichapetalum madagascariensis, Paederia bojeri* subsp. *foetens,* and *Tiliacora funifera.*

Abiotic environment and climate

Altitude range of 25 to 180 m asl with a mean of 106 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 58.4% while the similarly measured clay content is 25.6%. Soil pH is 6.1.

Precipitation during driest quarter is 53.1 mm.



Species of Conservation Importance

Endemic Plant Species

Bauhinia burrowsii [E], *Croton aceroides* [E], *Croton inhambanensis* [E], *Dolichandrone alba* [E], *Ozoroa gomesiana* [E].

Threatened Plant Species

Bauhinia burrowsii [EN], *Croton aceroides* [EN], *Croton inhambanensis* [VU], *Ozoroa gomesiana* [VU].

Biogeographic Anomalies

Cussonia zimmermannii, Dichapetalum deflexum, Dichapetalum madagascariensis.

Photographic credits *left*: near Malevane, Inhambane Province. photo: W. McCleland; *right*: inland from Vilanculos, Inhambane Province. photo: M. Stalmans.

RLE Assessment

Assessment Summary

This ecosystem has a restricted geographic distribution but there is little evidence of ongoing declines in extent. However, moderate to high degradation levels are present across most of the distribution of the ecosystem. **Vulnerable**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 17.26% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 170 10 x 10 km grid cells and an EOO of 17811.82 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 21.28% of the current distribution faces >90 percent degradation severity, 34.3% of the distribution faces >70 percent degradation severity, and 87.39% of the distribution faces >50 percent degradation severity. Vulnerable

Criterion E: Not evaluated

WESTERN MAPUTALAND CLAY BUSHVELD

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Pradaria arbustiva em argila do oeste de Maputaland
Biome Savannas and grasslands (T4)
Functional group Trophic savannas (T4.1)
Regional Ecosystem Lowveld Savanna

Description

A dry, mixed deciduous open woodland, or wooded grassland, dominated by the genus *Acacia*, on deep clay soils.

Distribution

Extending from KwaZulu-Natal in South Africa, northwards along the eastern base of the Lebombo mountain range as far north as the Uanetze River. Occurring in Maputo Province.

Characteristic native biota

A dry, mixed deciduous woodland dominated by the genus *Acacia*, mainly *A. burkei, A. borleae, A. exuvialis, A. gerrardii* subsp. *gerrardii, A. grandicornuta, A. luederitzii* var. *retinens, A. nigrescens, A. nilotica* subsp. *kraussiana, A. senegal* var. *rostrata, A. swazica, A. tortilis* subsp. *heteracantha, A. welwitschii* subsp. *delagoensis* and *A. xanthophloea*. Other typical trees are *Albizia anthelmintica, A. harveyi, A. petersiana* subsp. *evansii, Berchemia zeyheri, Bolusanthus speciosus, Combretum hereroense, C. imberbe, C. molle, C. zeyheri, Commiphora neglecta, Dalbergia melanoxylon, Elaeodendron transvaalense, Euclea divinorum, E. natalensis* subsp. *natalensis, Lannea schweinfurthii, Manilkara mochisia, Ozoroa engleri, Pappea capensis, Peltophorum africanum, Philenoptera violaceae, Pterocarpus rotundifolius* subsp. *rotundifolius, Sclerocarya birrea* subsp. *caffra, Spirostachys africana, Terminalia prunioides,* and *Ziziphus mucronata* subsp. *mucronata.*

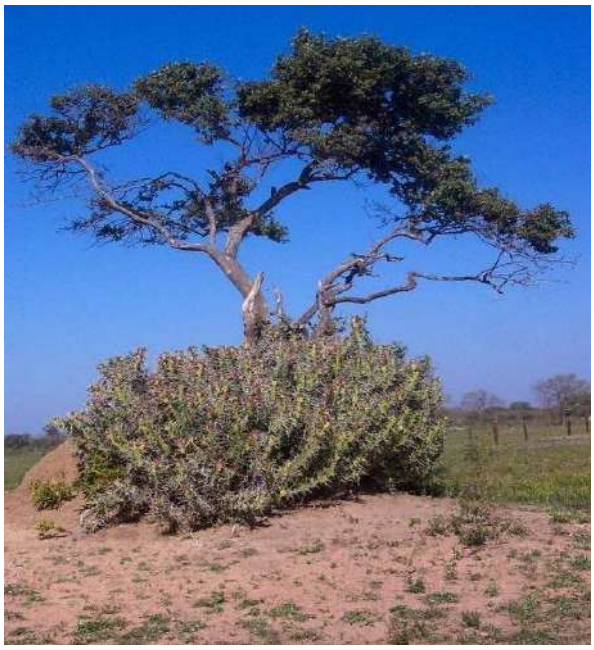
Small trees, shrubs and climbers are numerous; the characteristic species recorded are *Acacia borleae, Azima tetracantha, Cadaba termitaria, Capparis tomentosa, Cissus quadrangularis, Croton gratissimus* var. *gratissimus, Dalbergia melanoxylon, Dichrostachys cinerea* subsp. *africana, Ehretia obtusifolia, E. rigida, Erythrina humeana, Euphorbia grandicornis, Flueggea virosa, Grewia bicolor, G. caffra, G. hexamita, Gymnosporia buxifolia, G. senegalensis, Kraussia floribunda, Maerua juncea, M. parvifolia, Monodora junodii, Mystroxylon aethiopicum, Phyllanthus reticulatus, Pyrostria hystrix, Olax dissitiflora, Ormocarpum trichocarpum, Salvadora persica, Schotia capitata, Searsia gueinzii, Strophanthus petersianus, Thilachium africanum, Ximenia americana* var. *americana, X. caffra* var. *caffra,* and *Zanthoxylum humile.*

Riparian trees include species such as *Acacia xanthophloea, A. robusta* subsp. *clavigera, Breonadia salicina, Faidherbia albida, Combretum imberbe, Diospyros mespiliformis, Ficus sycomorus* subsp. *sycomorus, Philenoptera violacea, Phoenix reclinata, Phyllanthus reticulatus, Schotia brachypetala, Sideroxylon inerme,* and *Xanthocercis zambesiaca.*

Softer shrubs and herbaceous species include *Abutilon indicum* subsp. *guineense, Adenium multiflorum, A. swazicum, Aloe suffulta, Corbichonia decumbens, Cotyledon barbeyi, Crotalaria schlechteri, Ecbolium glabratum, Gladiolus brachyphyllus, Euphorbia knuthii, E. lugardiae, Gnidia capitata, Gossypium herbaceum* var. *africanum, Hibiscus trionum, Hilliardiella oligocephala, Indigofera lupatana, I. schimperi* var. *schimperi, Jatropha variifolia, Kalanchoe lanceolata, Merremia palmata, Neorautanenia mitis, Polygala senensis, Rhynchosia albissima, Sesbania sesban, S.*

tetraptera subsp. *tetraptera, Sida hoepfneri, Solanum torreanum, Tephrosia purpurea* var. *pubescens*, and *Turbina oblongata*.

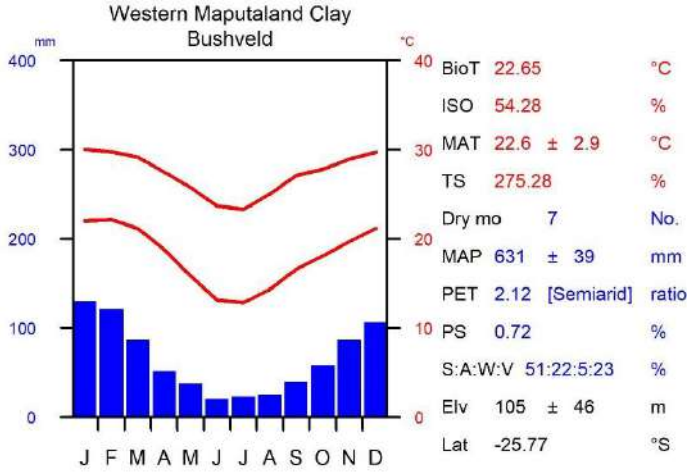
Grasses are often dominant in the landscape, some of which include *Alloteropsis cimicina, Andropogon gayanus* var. *polycladus, Aristida congesta* subsp. *barbicollis, Bothriochloa insculpta, Brachiaria eruciformis, Cenchrus ciliaris, Dinebra retroflexa* var. *condensata, Enneapogon cenchroides, Eragrostis barbinodis, E. cilianensis, E. cylindriflora, E. superba, Heteropogon contortus, Hyperthelia dissoluta, Leptochloa eleusine, L. panicea, Panicum coloratum, P. deustum, P. maximum, Perotis patens, Schoenefeldia transiens, Sehima galpinii, Setaria incrassata, Sorghum versicolor, Sporobolus pyramidalis, Themeda triandra,* and *Urochloa mossambicensis.*



Abiotic environment and climate

Altitude range of 20 to 220 m asl with a mean of 105 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 41.2% while the similarly measured clay content is 39.2%. Soil pH is 6.7.

Precipitation during driest quarter is 36.9 mm.



Species of Conservation Importance

Endemic Plant Species

Barleria oxyphylla [NE*], *Ecbolium glabratum* [NE], *Polygala francisci* [E], *Polygala torrei* [E], *Syzygium komatiense* [NE], *Tragia glabrata* var. *hispida* [E].

Threatened Plant Species

Barleria oxyphylla [VU*], *Polygala francisci* [VU], *Polygala torrei* [DD].

Biogeographic Anomalies

Adenium swazicum, Euphorbia knuthii, Solanum torreanum.

Photographic credits *left*: *Adenium multiflorum* (photo: J. Burrows) and *right*: *Euphorbia grandicornis* (photo: M. Lotter) in Western Maputaland Clay Bushveld, Maputo Province.

RLE Assessment

Assessment Summary	Assessment Information
This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**	**Criterion A:** Expansion of urban areas, agriculture & deforestation has caused a 24.63% decline since 1750. Least Concern **Criterion B:** This ecosystem has an AOO of 66 10 x 10 km grid cells and an EOO of 6087.27 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern **Criterion C:** Not evaluated **Criterion D:** Degradation assessment shows that 1.81% of the current distribution faces >90 percent degradation severity, 7.79% of the distribution faces >70 percent degradation severity, and 36.97% of the distribution faces >50 percent degradation severity. Least Concern **Criterion E:** Not evaluated

LIMPOPO RIDGE MOPANE WOODLAND

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Mata de Mopane da Cordilheira do Limpopo
Biome Savannas and grasslands (T4)
Functional group Trophic savannas(T4.1)
Regional Ecosystem Mopane Woodland

Description

Short to medium-sized deciduous woodland on sandstone derived hills and ridges.

Distribution

Extending from northern South Africa into Mozambique along the upper Limpopo River valley, Gaza Province.

Characteristic native biota

A vegetation unit with a mixed canopy tree composition but still largely dominated by *Colophospermum mopane*. Other important constituents include *Acacia nigrescens, A. senegal* var. *leiorhachis, A. tortilis* subsp. *heteracantha, Adansonia digitata, Boscia albitrunca, Cladostemon kirkii, Combretum apiculatum, C. imberbe, Commiphora glandulosa, C. mollis, C. tenuipetiola*ta, *Ficus abutilifolia, F. tettensis, Kirkia acuminata, Maerua angolensis, Sclerocarya birrea* subsp. *caffra, Sterculia rogersii, Terminalia prunioides*,and *Ximenia americana.*

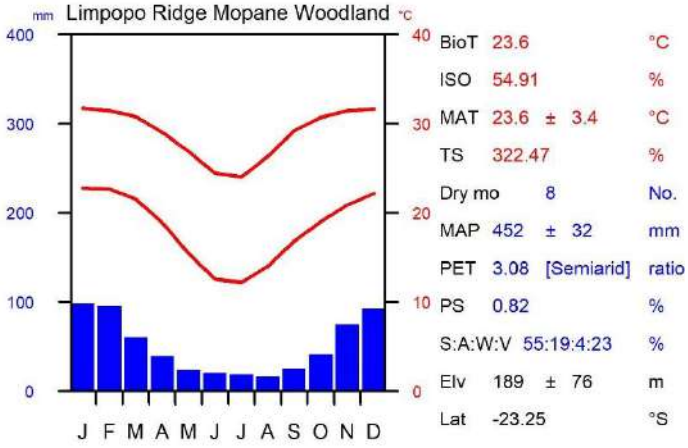
Small trees and shrubs include *Anisotes rogersii, Barleria affinis, Blepharis diversispina, Catophractes alexandri, Cissus cornifolia, Commiphora pyracanthoides, Euphorbia limpopoana, Gardenia resiniflua, Grewia bicolor, G. villosa, Hibiscus calyphyllus, H. micranthus, Neuracanthus africanus, Plinthus rehmannii,* and *Ptycholobium contortum*.

The herbaceous layer includes *Aristida adscensionis, A. stipitata* subsp. *graciliflora, Digitaria eriantha* subsp. *eriantha, Enneapogon cenchroides, Panicum maximum, Schmidtia pappophoroides,* and *Stipagrostis uniplumis.*

Abiotic environment and climate

Altitude range of 70 to 400 m asl with a mean of 189 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 60.7% while the similarly measured clay content is 24.3%. Soil pH is 6.7.

Precipitation during driest quarter is 17.7 mm.



Species of Conservation Importance: none recorded.

Photographic credits *top*: northern Limpopo National Park, Maputo Province. photo: M. Stalmans; *bottom left*: *Colophospermum* woodland, Limpopo National Park. photo. M. Stalmans. *bottom right*: northern Limpopo National Park. photo: M. Lotter.

RLE Assessment

Assessment Summary	Assessment Information
This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**	**Criterion A:** Expansion of urban areas, agriculture & deforestation has caused a 14.31% decline since 1750. Least Concern **Criterion B:** This ecosystem has an AOO of 152 10 x 10 km grid cells and an EOO of 24943.38 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern **Criterion C:** Not evaluated **Criterion D:** Degradation assessment shows that 0% of the current distribution faces >90 percent degradation severity, 6.84% of the distribution faces >70 percent degradation severity, and 52.56% of the distribution faces >50 percent degradation severity. Least Concern **Criterion E:** Not evaluated

LUIA BASALT MOPANE WOODLAND

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Mata de mopane sob basalto de Lula

Biome Savannas and grasslands (T4)

Functional group Trophic savannas (T4.1)

Regional Ecosystem Mopane Woodland

Description

Short to medium height deciduous mopane woodland on basalt.

Distribution

In Mozambique, between Chintholo and Maringue on basalt. Occurring in Manica, Sofala, and Tete Provinces.

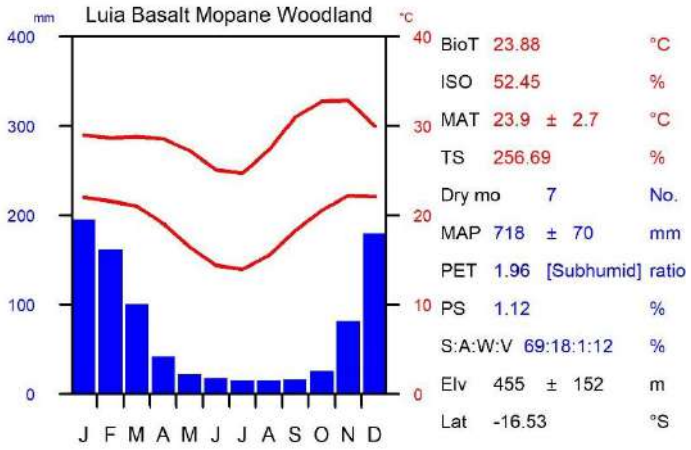
Characteristic native biota

A low (4-8 m) open woodland dominated by *Colophospermum mopane* (mopane), *Combretum apiculatum* and *Terminalia stuhlmannii*, but occurring on basalt outcrops rather than Karoo sediments. Associated tree and shrub species include *Acacia nigrescens, Acacia senegal* var. *leiorhachis, Commiphora caerulea, C. glandulosa, C. mossambicensis, Croton gratissimus, Diospyros quiloensis, Dirichletia pubescens, Gardenia resiniflua, Grewia bicolor, Kirkia acuminata, Pterocarpus brenanii, Sclerocarya birrea, Sterculia africana, Terminalia stuhlmannii,* and *Trichilia capitata*. The shrub layer is poorly developed, but grass cover is relatively high at 70-90%

Abiotic environment and climate

Altitude range of 200 to 750 m asl with a mean of 455 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 46.5% while the similarly measured clay content is 33.7%. Soil pH is 6.6.

Precipitation during driest quarter is 9.2 mm.



Species of Conservation Importance: none recorded.

RLE Assessment

Assessment Summary	Assessment Information
This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**	**Criterion A:** Expansion of urban areas, agriculture & deforestation has caused a 13.42% decline since 1750. Least Concern **Criterion B:** This ecosystem has an AOO of 82 10 x 10 km grid cells and an EOO of 24619.5 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern **Criterion C:** Not evaluated **Criterion D:** Degradation assessment shows that 0.05% of the current distribution faces >90 percent degradation severity, 2.73% of the distribution faces >70 percent degradation severity, and 22.13% of the distribution faces >50 percent degradation severity. Least Concern **Criterion E:** Not evaluated

MÁGOÈ SANDSTONE MOPANE WOODLAND

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Mata de mopane em arenito de Magoé
Biome Savannas and grasslands (T4)
Functional group Trophic savannas (T4.1)
Regional Ecosystem Mopane Woodland

Description

A seasonally-dry deciduous mopane woodland.

Distribution

Occurring on the southern slopes of the Zambezi valley in north-western Mozambique, Tete Province. Also extending into Zambia and Zimbabwe

Characteristic native biota

Dominated by *Colophospermum mopane* as well as the genera *Combretum, Acacia* and *Diospyros.* Recorded trees are *Adansonia digitata, Acacia ataxacantha, A. gerrardii, A. kirkii* subsp. *kirkii, A, nigrescens, A. nilotica* subsp. *kraussiana, A. senegal* var. *leiorhachis, A. tortilis* subsp. *spirocarpa, Albizia anthelmintica, A. brevifolia, Berchemia discolor, Bolusanthus speciosus, Cassia abbreviata* subsp. *beareana, Combretum adenogonium, C. apiculatum, C. collinum, C. hereroense, C. kirkii, C. microphyllum, C. mossambicensis, C. molle, C. zeyheri, Commiphora africana, Diospyros kirkii, D. quiloensis, D. senensis, D. squarrosa, Grewia* spp., *Lannea schweinfurthii, Manilkara mochisia, Pteleopsis myrtifolia, Pterocarpus rotundifolius* subsp. *martinii* and subsp. *polyanthus, Strychnos spinosa, Swartzia madagascariensis, Terminalia prunioides, T. stuhlmannii*, and *Xeroderris stuhlmannii.*

Small trees and woody shrubs recorded are *Abrus precatorius* subsp. *africana, Bauhinia petersiana, Cadaba kirkii, Capparis tomentosa, Dalbergia melanoxylon, Deinbollia xanthocarpa, Dichrostachys cinerea* subsp. *argillicola* and subsp. *africana, Elaeodendron matabelicum, Euclea divinorum, E. schimperi, Feretia aeruginescens, Gymnosporia senegalensis, Maclura africana, Maerua nervosa, M. parviflora, Mimosa mossambicensis, Ormocarpum trichocarpum, Olax dissitiflora, Pavetta klotzschiana, Salvadora persica* subsp. *pubescens,* and *Thilachium africanum*. Soft shrubs and herbaceous species recorded are *Crotalaria monteiroi* subsp. *galpinii, C. pallida* var. *obovata, C. podocarpa, Hibiscus trionum, Rhynchosia sublobata, R. totta* var. *fenchelii, R. wildii, Tephrosia noctiflora* and *T. rhodesiaca* subsp. *rhodesiaca.*

Grasses recorded are *Bothriochloa radicans, Chrysopogon nigritanus, Cymbopogon giganteus, Diheteropogon amplectens, Echinochloa pyramidalis, Eragrostis rigidior, Heteropogon contortus, H. melanocarpus, Hyparrhenia dichroa, Schmidtia pappophoroides, Sorghum versicolor, Sporobolus panicoides, Stereochlaena cameronii,* and *Urochloa mossambicensis.*

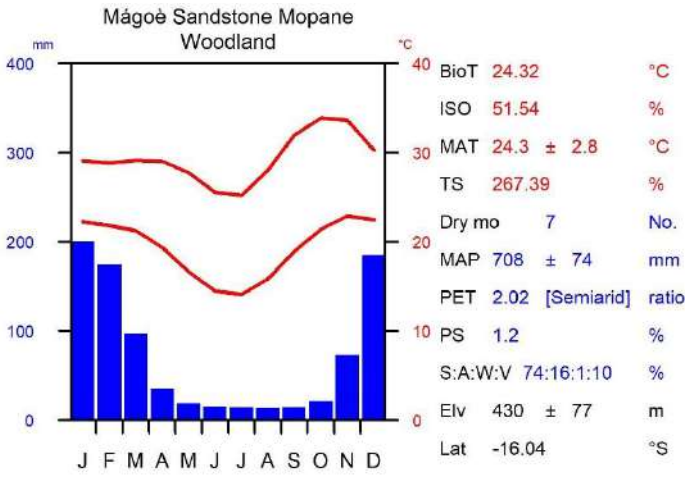
Higher sandy ground and rocky hills support the trees *Brachystegia glaucescens, B. bussei, Julbernardia globiflora, Afzelia quanzensis, Entandrophragma caudatum, Gardenia resiniflua, Kirkia acuminata, Peltophorum africanum, Steganotaenia araliacea*, and *Terminalia sericea*, among others.

Along some of the larger tributaries, including the alluvial platforms, there is riparian woodland (see also Zambezi Alluvial Forest) composed of *Acacia robusta* subsp. *clavigera, A. xanthophloea, Albizia versicolor, Combretum imberbe, Cordyla africana, Diospyros mespiliformis, Faidherbia albida, Ficus bussei, F. sycomorus* subsp. *sycomorus, Philenoptera violacea, Sterculia appendiculata, Trichilia emetica*, and *Xanthocercis zambesiaca.*

Abiotic environment and climate

Altitude range of 250 to 600 m asl with a mean of 430 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 64.0% while the similarly measured clay content is 22.8%. Soil pH is 6.6.

Precipitation during driest quarter is 1.8 mm.



Species of Conservation Importance: none recorded.

RLE Assessment

Assessment Summary

This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 19.65% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 163 10 x 10 km grid cells and an EOO of 22104.33 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0% of the current distribution faces >90 percent degradation severity, 0.79% of the distribution faces >70 percent degradation severity, and 21.1% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

SOUTHERN MOPANE WOODLAND

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Mata de mopane do sul

Biome Savannas and grasslands (T4)

Functional group Trophic savannas (T4.1)

Regional Ecosystem Mopane Woodland

Description

Tall deciduous woodland dominated by *Colophospermum mopane*, but may be shrub like on very clay soils. Occasional pans present.

Distribution

Limited to southern Mozambique, between Massangena and Zinave, southwards to Maheke. Occurring in Gaza, Inhambane, Manica, and Maputo Provinces.

Characteristic native biota

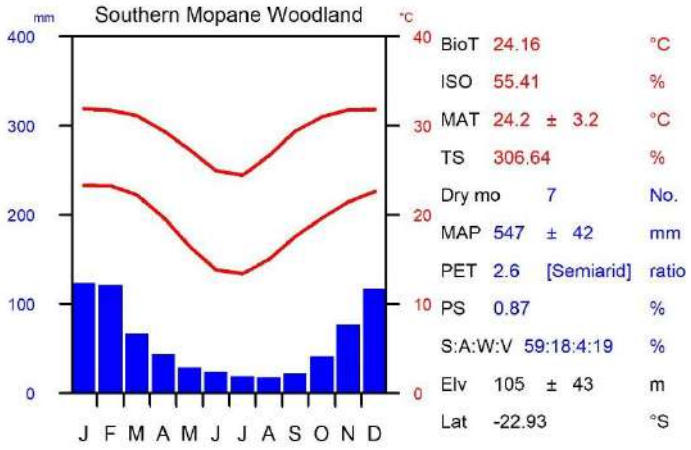
A woodland association defined and characterized by the presence of *Colophospermum mopane*, either in pure stands or scattered and often associated with *Combretum apiculatum*. Other tree species recorded in this vegetation association are *Acacia senegal* subsp. *rostrata, A. tortilis, Albizia forbesii, Amblygonocarpus andongensis, Berchemia discolor, Boscia albitrunca, Cassia abbreviata, Dalbergia melanoxylon, Dolichandrone alba, Drypetes mossambicensis, Guibourtia conjugata, Lannea stuhlmannii, Manilkara mochisia, Millettia usaramensis, Newtonia hildebrandtii* var. *pubescens, Philenoptera bussei, Sclerocarya birrea* subsp. *caffra, Sterculia africana, Terminalia sericea* and *Xeroderris stuhlmannii.*

Woody shrubs and small trees include *Abrus precatorius, Artabotrys brachypetalus, Baphia massaiensis* subsp. *obovata, Bauhinia tomentosa, Cadaba termitaria, Cladostemon kirkii, Coptosperma littorale, Flueggea virosa, Grewia bicolor, Gymnosporia putterlickioides, Maerua brunnescens* subsp. *scandens, Mystroxylon aethiopicum* and *Ximenia americana* var. *microphylla*. Smaller semi-herbaceous species recorded are *Agathisanthemum bojeri, Dicerocaryum forbesii, Gossypium herbaceum, Harpagophytum forbesii, Sansevieria hyacinthoides* and *Aloe parvibracteata*. Grasses are typically *Aristida* spp., *Digitaria eriantha, Heteropogon contortus, Ischaemum afrum, Panicum maximum, Schmidtia pappophoroides* and *Urochloa mossambicensis.* Within this mopane veld, on calcareous soils, there are patches or areas of sandy soil, too small to map, which are dominated by *Guibourtia conjugata* and other sandveld elements

Abiotic environment and climate

Altitude range of 40 to 230 m asl with a mean of 105 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 62.5% while the similarly measured clay content is 23%. Soil pH is 6.6. The small patches of *Guibourtia* woodland on sand that occurs throughout this unit result in higher sand content than where mopane occur.

Precipitation during driest quarter is 19.9 mm.



Species of Conservation Importance

Endemic Plant Species

Indigofera torrei [E].

Photographic credits left: mopane woodland, northern Limpopo National Park, Maputo Province. photo: J. Burrows; right: Banhine National Park, Gaza Province. photo: M. Stalmans.

RLE Assessment

Assessment Summary

This ecosystem has a wide distribution and there is little evidence of large declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 11.62% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 420 10 x 10 km grid cells and an EOO of 55766.48 km2. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.06% of the current distribution faces >90 percent degradation severity, 0.98% of the distribution faces >70 percent degradation severity, and 17.61% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

ZAMBEZI VALLEY MOPANE WOODLAND

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Mata de mopane do Vale do Zambeze
Biome Savannas and grasslands (T4)
Functional group Trophic savannas (T4.1)
Regional Ecosystem Mopane Woodland

Description
A seasonally-dry mixed deciduous mopane woodland

Distribution

In the Zambezi valley, extending between Zambia through the Zambezi valley as far as Lengwe National Park in Malawi. Occurring in Manica and Tete Provinces.

Characteristic native biota

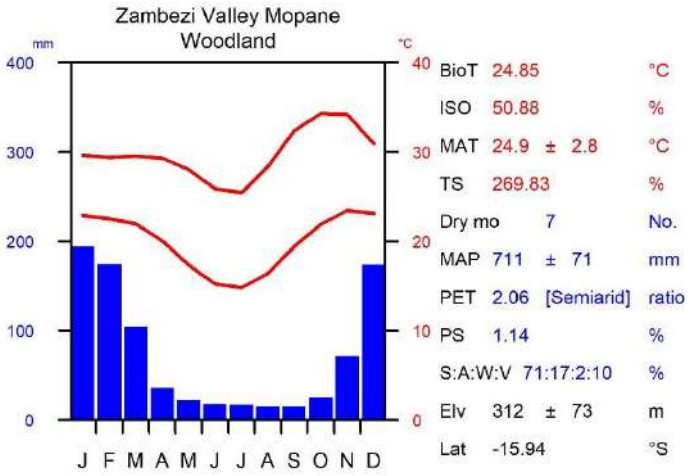
Beside eponymous *Colophospermum mopane*, the diagnostic trees include: *Acacia nigrescens, A. tortilis* subsp. *spirocarpa, Adansonia digitata, Terminalia prunioides, Ziziphus mauritiana* and the palm *Hyphaene petersiana*. Other trees include: *Acacia ataxacantha, A. eriocarpa, A. gerrardii, A. hockii, A. kirkii, A. mellifera* var. *detinens, A. nilotica* subsp. *kraussiana, A. polyacantha* subsp. *campylacantha, A. robusta* var. *clavigera, A. senegal* var. *leiorhachis, A. sieberiana* var. *woodii, A. welwitschii* subsp. *delagoensis, Albizia amara* subsp. *sericocephala, A. anthelmintica, A. antunesiana, A. brevifolia, A. harveyi, A. versicolor, Boscia mossambicensis, Cassia abbreviata* subsp. *beareana, Commiphora* spp. (*africana* var. *africana, glandulosa, marlothii, mollis, pyracanthoides, viminea*), *Combretum* spp. *(adenogonium, apiculatum, hereroensis, imberbe, microphyllum, mossambicense, obovatum), Dalbergia melanoxylon, Diospyros* spp. *(kirkii, quiloensis, squarrosa, senensis), Guibourtia conjugata, Lecaniodiscus fraxinifolius, Lonchocarpus bussei, Pterocarpus* spp. *(brenanii, chrysothrix, lucens* subsp. *antunesii), Senna obtusifolia, S. petersiana, S. singueana, Sterculia africana, Terminalia stuhlmannii, Trichilia capitata, Xeroderris stuhlmannii,* and *Ziziphus mucronata*.

Small trees and shrubs are *Bauhinia natalensis, B. petersiana, B. tomentosa, Cadaba* spp., *Canthium glaucum* subsp. *frangula, Capparis sepiaria* var. *subglabra, C. tomentosa, Catunaregam pentandra, Dalbergia arbutifolia* subsp. *arbutifolia, Dichrostachys cinerea* (numerous subspecies and varieties), *Dirichletia pubescens, Dombeya kirkii, Elephantorrhiza goetzei, Entada abyssinica, Euclea schimperi, Grewia pachycalyx Gymnosporia pubescens, Maerua* spp., *Ormocarpum trichocarpum, O. zambesiacum, Sesbania* spp. *(greenwayi, macrantha* subsp. *macrantha, sesban* var. *nubica, tetraptera), Thilachium africanum, Turraea zambesiaca, Vepris rogersii,* and *Ximenia americana* var. *microphylla.* The family Acanthaceae is abundant (*Barleria prionitis* subsp. *delagoensis, Blepharis* spp., *Neuracanthus africanus, Duosperma quadrangulare*), as are legumes (*Crotalaria* spp., *Indigofera* spp., etc.). Grasses include *Aristida vestita, Eragrostis* spp., *Ischaemum glaucostachyum, Panicum coloratum, Setaria petiolata,* etc. Riparian vegetation includes *Acacia robusta* var. *clavigera, Albizia glaberrima, A. zimmermannii, Berchemia discolor, Diospyros mespiliformis, Faidherbia albida, Ficus sycomorus* subsp. *sycomorus, Khaya anthotheca, Kigelia africana, Philenoptera violacea, Sterculia appendiculata, Trichilia emetica,* and *Xanthocercis zambesiac*a. On the rocky hills occur *Afzelia quanzensis, Brachystegia bussei, B. glaucescens, Erythrophleum africanum, Julbernardia globiflora, Kirkia acuminata, Pterocarpus rotundifolius* subsp. *polyanthus*, and *Sterculia quinqueloba.*

Abiotic environment and climate

Altitude range of 120 to 450 m asl with a mean of 312 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 62.8% while the similarly measured clay content is 21.6%. Soil pH is 6.5.

Precipitation during driest quarter is 6.6 mm.



Species of Conservation Importance

Endemic Plant Species

Vepris myrei [E].

Threatened Plant Species

Vepris myrei [EN].

RLE Assessment

Assessment Summary

This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 19.79% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 289 10 x 10 km grid cells and an EOO of 55685.14 km2. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.67% of the current distribution faces >90 percent degradation severity, 5.38% of the distribution faces >70 percent degradation severity, and 34.1% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

NORTHERN COASTAL DRY WOODLAND

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Mata seca costeira do norte
Biome Savannas and grasslands (T4)
Functional group Trophic savannas (T4.1)
Regional Ecosystem Swahilian Savanna

Description

Mixed dry deciduous coastal woodland.

Distribution

Limited to Mozambique, extending from Quiterajo (Cabo Delgado) southwards to just south of Nacala (Nampula Province).

Characteristic native biota

There is a lot of variation within this unit with a range of soil and local plant communities. A significant extent of the part north of Rio Montepuez lies on clay-rich calcareous soils and supports *Acacia* woodland with *Acacia robusta* subsp. *usambarensis*, *A. polyacantha, Dalbergia melanoxylon* and *Spirostachys africana*. Further south vegetation occurs on sandy soils and is dominated by mixed broadleaf woodland with *Pteleopsis myrtifolia* and *Millettia stuhlmannii.*

Some of the most characteristic trees of this vegetation type include *Adansonia digitata, Acacia nigrescens, A. polyacantha* subsp. *campylacantha, Afzelia quanzensis, Brachystegia spiciformis, B. boehmii, Ficus sycomorus, Millettia stuhlmannii, Philenoptera violacea, Pteleopsis myrtifolia*, and *Sterculia appendiculata.*

Other additional trees recorded are, alphabetically, Acacia (*amythethophylla, gerrardii, latispina, latistipulata, robusta subsp. usambarensis, schweinfurthii* var. *schweinfurthii, senegal, seyal* var. *fistula, sieberiana* var. *sieberiana*), Albizia (*adianthifolia, amara* subsp. *amara, brevifolia, forbesii, glaberrima* var. *glabrescens, harveyi, petersiana* subsp. *petersiana, versicolor*), *Amblygonocarpus andongensis, Berlinia orientalis, Boscia salicifolia, Cassia abbreviata* subsp. *beareana, Cassipourea mossambicensis, Cladostemon kirkii, Combretum collinum* subsp. *suluense, Cordyla africana, Dalbergia melanoxylon, D. nitidula, Diospyros kirkii, Doberia loranthifolia, Dracaena mannii, Elaeodendron schlechterianum, Euphorbia cooperi, E. halipedicola, E. lividiflora, Fernandoa magnifica, Ficus lingua* subsp. *depauperata, F. tremula* subsp. *tremula, Holarrhena pubescens, Hymenaea verrucosa, Khaya anthotheca* (riverine), *Lannea schimperi, Maerua angolensis, Manilkara discolor, M. sansibarensis, Markhamia zanzibarica, Micklethwaitia carvalhoi, Millettia bussei, M. usaramensis, Mimusops zeyheri, Olax dissitiflora, Parkia filicoidea* (riverine), *Philenoptera bussei, Phoenix reclinata, Pouteria alnifolia* var. *alnifolia, Terminalia* (*Pteleopsis*) *barbosae, Pterocarpus angolensis, Senna singueana, Sideroxylon inerme, Spirostachys africana, Sterculia africana, Tabernaemontana elegans, Tamarindus indica, Tetracera boiviniana, Thespesia mossambicensis*, and *Xeroderris stuhlmannii*. The palm species *Hyphaene compressa* (diagnostic) and *H. coriacea* are also frequent in low-lying areas.

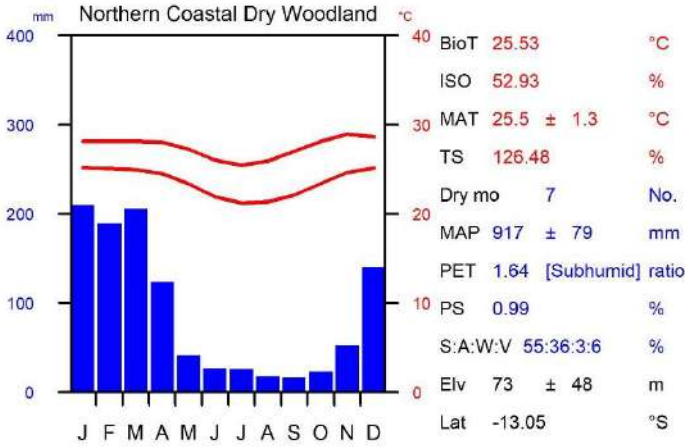
Woody shrubs and small trees include *Abrus precatorius, Allophylus torrei, Annona senegalensis, Bauhinia petersiana, B. tomentosa, Buchnerodendron lasiocalyx, Cadaba kirkii, Cleistochlamys kirkii, Clerodendrum hildebrandtii* var. *hildebrandtii, Combretum andradae, C. caudatisepalum, C. constrictum, Cordia goetzei, Cremaspora triflora* subsp. *confluens, Croton kilwae, Deinbollia borbonica, Dichrostachys cinerea* (subsp. *africana, forbesii,* and *hirtipes), Diospyros kabuyeana, D. loureiriana* subsp. *loureiriana, D. squarrosa, Dirichletia pubescens, Dovyalis hispidula, Grewia holstii, G. triflora, Heinsia mozambicensis, Maerua andradae, M. edulis, Millettia makondensis, Monodora grandidieri, M. junodii* var. *junodii, Ochna ovata, Opilia amentacea, Ormocarpum schliebenii, Pancovia holstii* subsp. *holstii, Paropsia*

braunii, Phellocaylx vollesenii, Premna schliebenii, Rauvolfia mombasiana (riverine), *Rourea coccinea* var. *boiviniana, R. orientalis, Synaptolepis oliveriana, Tannodia tenuifolia* var. *tenuifolia, Thilachium africanum,* and *Ximenia caffra* var. *natalensis*.

Abiotic environment and climate

Altitude range of 5 to 250 m asl with a mean of 73 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 56.2% while the similarly measured clay content is 27%. Soil pH is 6.3.

Precipitation during driest quarter is 18.2 mm.



Species of Conservation Importance

Endemic Plant Species

Acacia latispina [E], *Allophylus torrei* [E], *Heinsia mozambicensis* [E], *Millettia makondensis* [NE], *Premna schliebenii* [NE], *Terminalia* (*Pteleopsis*) *barbosae* [E].

Threatened Plant Species

Coffea zanguebariae [VU], *Millettia makondensis* [VU], *Premna schliebenii* [VU], *Terminalia* (*Pteleopsis*) *barbosae* [VU].

Biogeographic Anomalies

Berlinia orientalis, Cissus bathyrhakodes, Dobera loranthifolia, Maerua andradae, Micklethwaitia carvalhoi, Momordica henriquesii, Ochna ovata, Phellocalyx vollesenii, Pouteria alnifolia, Rauvolfia mombasiana, Thespesia mossambicensis.

Photographic credits looking north from the Lurio River towards Mt Yoloko, Cabo Delgado Province. photo: J. Burrows.

RLE Assessment

Assessment Summary

This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 22.49% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 115 10 x 10 km grid cells and an EOO of 13634.66 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 2.89% of the current distribution faces >90 percent degradation severity, 9.07% of the distribution faces >70 percent degradation severity, and 34.34% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

BANGOMATETE RHYOLITE DRY WOODLAND

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Mata seca de riolito de Bangomatete

Biome Savannas and grasslands (T4)

Functional group Trophic savannas (T4.1)

Regional Ecosystem Zambezian Savanna

Description

Mixed deciduous woodland on shallow soils and rocky ridges.

Distribution

On elevated rhyolite ridges between Mphende and the Luenha River in Tete district, Tete Province.

Characteristic native biota

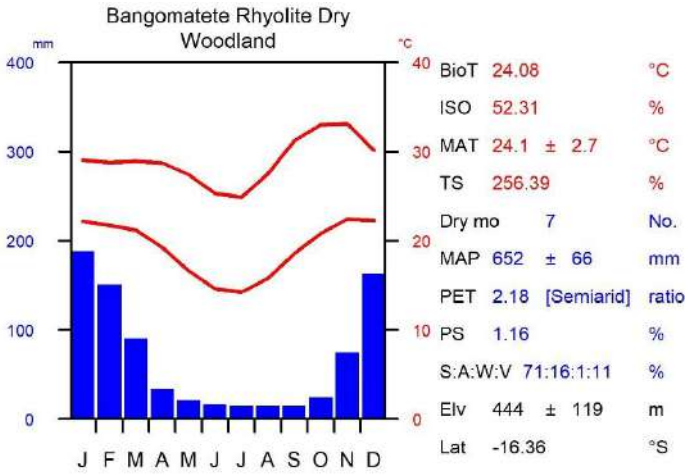
A diverse woodland on shallow soils, poorly explored but with the following more typical species: *Albizia tanganyikensis, Anisotes bracteatus, Barleria albostellata, Barleria senensis, Brachystegia allenii, Brachystegia longifolia, Combretum padoides, Commiphora marlothii, Crabbea hirsuta, Crotalaria monteiroi, Dombeya kirkii, Elaeodendron matabelicum, Erythrococca menyharthii, Euphorbia espinosa, Ficus salicifolia, Haplocoelum foliosum, Kalanchoe lanceolata, Loeseneriella africana, Maerua buxifolia, Margaritaria discoidea, Mystroxylon aethiopicum, Psiadia punctulata, Psydrax martinii, Pteleopsis anisoptera, Strychnos usambarensis, Tarchonanthus camphoratus, Tarchonanthus trilobus, Tephrosia rhodesica, Terminalia sambesiaca* and *Vepris zambesiaca*.

On steep slopes a more thicket-like vegetation develops, comprising *Acacia ataxacantha, A. nigrescens, A. nilotica, A. senegal, Canthium glaucum* subsp. *frangula, Commiphora glandulosa, Dichrostachys cinerea, Psydrax livida, Psydrax martinii,* and *Zanthoxylum chalybeum*.

Abiotic environment and climate

Altitude range of 205 to 700 m asl with a mean of 444 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 50.5% while the similarly measured clay content is 29.3%. Soil pH is 6.4.

Precipitation during driest quarter is 3.8 mm.



Key processes and interactions

Slower-eroding rhyolite that overlays basalt. Rocky ridges clearly visible on imagery. Composition will be different.

Species of Conservation Importance: none recorded.

RLE Assessment

Assessment Summary

This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 7.07% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 33 10 x 10 km grid cells and an EOO of 4919.74 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0% of the current distribution faces >90 percent degradation severity, 1.29% of the distribution faces >70 percent degradation severity, and 19.79% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

CANXIXE LOWLAND DRY WOODLAND

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Mata seca das terras baixas de Canxixe
Biome Savannas and grasslands (T4)
Functional group Trophic savannas (T4.1)
Regional Ecosystem Zambezian Savanna

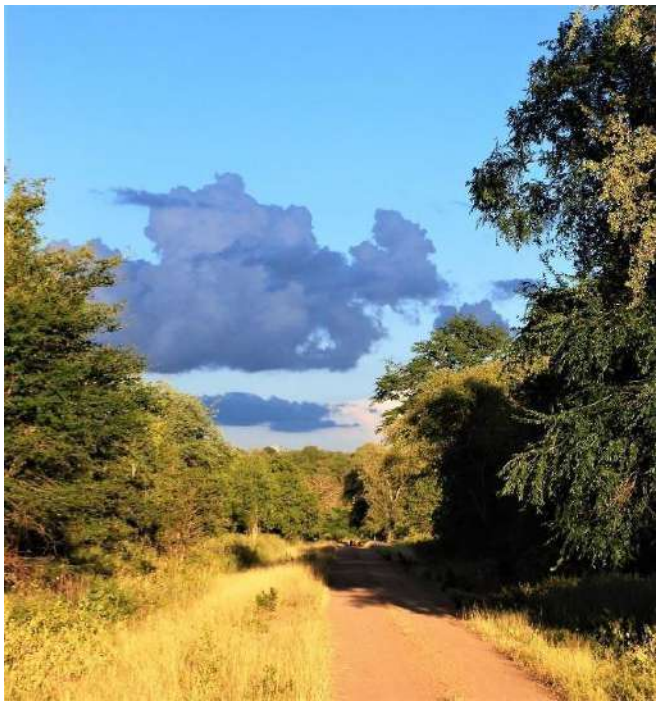
Description

Mixed dry deciduous woodland.

Distribution

Limited to Mozambique, from just south of Lupata, southwards towards Vanduzi just east of Mt Gorongosa. Occurring in Manica, Sofala, and Tete Provinces.

Characteristic native biota



The dominant trees are *Acacia nigrescens, Adansonia digitata, Afzelia quanzensis, Albizia harveyi, Colophospermum mopane, Combretum imberbe, C. microphyllum, Cordyla africana, Guibourtia conjugata, Kirkia acuminata, Millettia stuhlmannii, Philenoptera violacea, Pterocarpus lucens* subsp. *antunesii, Sclerocarya birrea* subsp. *caffra, Sterculia appendiculata, Tamarindus indica, Xeroderris stuhlmannii*, but with many other species of *Acacia* – *A. gerrardii* subsp. *gerrardii, A. nilotica* subsp. *kraussiana, A. polyacantha* subsp. *campylacantha, A. sieberiana* var. *woodii, A. tortilis* subsp. *spirocarpa* and *A. xanthophloea*.

Smaller trees and shrubs recorded are *Bauhinia petersiana, Boscia salicifolia, Commiphora africana* var. *africana, Cordia sinensis, Dalbergia melanoxylon, Dichrostachys cinerea, Diospyros loureiriana* subsp. *loureiriana, Grewia micrantha, Maerua parvifolia, M. triphylla* var. *pubescens, Pterocarpus brenanii, Sesbania tetraptera, Vitex petersiana, Ximenia americana* subsp. *microphylla, X. caffra* subsp. *natalensis,* and *Xylotheca tettensis*.

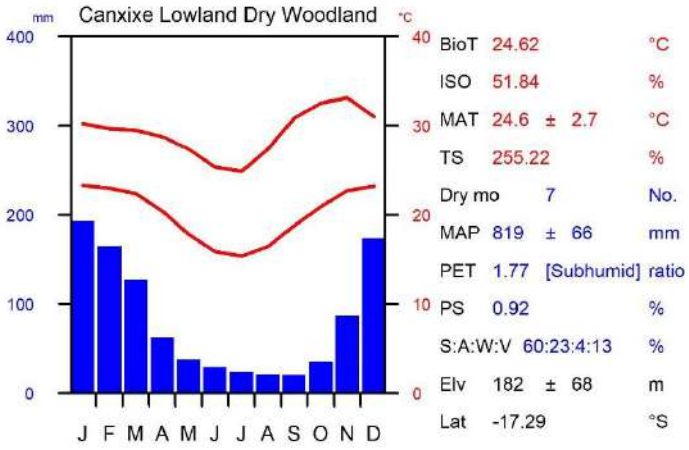
Riparian fringes are dominated by *Acacia robusta* var. *clavigera, Albizia glaberrima* var. *glabrescens, A. versicolor, Faidherbia albida, Kigelia africana,* and *Newtonia hildebrandtii.*

On grey soils over brown, slightly orange, sandy-clays, on platforms, ridges, cobbled areas, and chalky slopes one gets a deciduous woodland savanna of *Acacia nigrescens, A. adianthifolia* var. *adianthifolia, Annona senegalensis, Bauhinia petersiana, B. galpinii, Bolusanthus speciosus, Burkea africana, Combretum adenogonium, Crossopteryx febrifuga, Dichrostachys cinerea, Diospyros* spp., *Diplorhynchus condylocarpon, Lannea schweinfurthii, Piliostigma thonningii, Pseudolachnostylis maprouneifolia, Pterocarpus rotundifolius, Terminalia sericea*, and *Ziziphus mucronata*. The grass genera of *Cymbopogon, Hyparrhenia, Panicum, Setaria,* and *Urochloa* predominate.

Abiotic environment and climate

Altitude range of 55 to 350 m asl with a mean of 182 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 60.3% while the similarly measured clay content is 23.2%. Soil pH is 6.4.

Precipitation during driest quarter is 30.6 mm.



Species of Conservation Importance: none recorded.

Photographic credit between Tambara and Sena, Zambezi River valley. photo: J. Burrows.

RLE Assessment

Assessment Summary

This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 25.18% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 135 10 x 10 km grid cells and an EOO of 12955.94 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.19% of the current distribution faces >90 percent degradation severity, 2.23% of the distribution faces >70 percent degradation severity, and 31.09% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

DOMBE BASALT DRY WOODLAND

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Mata seca do basalto de Dombe
Biome Savannas and grasslands (T4)
Functional group Trophic savannas (T4.1)
Regional Ecosystem Zambezian Savanna

Description

Mixed deciduous woodland dominated by *Colophospermum mopane*, *Acacia* and Combretaceae.

Distribution

Extending from Gonarezhou National Park in Zimbabwe into Mozambique in a north east direction as far as Nhamatanda. Occurring in Manica, Sofala, and Tete Provinces.

Characteristic native biota

Mixed *Colophospermum mopane* woodland, but also with *Acacia nigrescens, Adansonia digitata, Berchemia discolor, Cassia abbreviata* subsp. *beareana, Cleistochlamys kirkii, Combretum apiculatum, C. hereroense, C. imberbe, Dalbergia melanoxylon, Entada abyssinica, Kirkia acuminata, Markhamia zanzibarica, Peltophorum africanum, Pericopsis angolensis, Philenoptera bussei, P. violacea, Pterocarpus brenanii, Sclerocarya birrea, Strychnos madagascariensis, Terminalia stenostachya, Vitex buchananii* and *Ziziphus mucronata.*

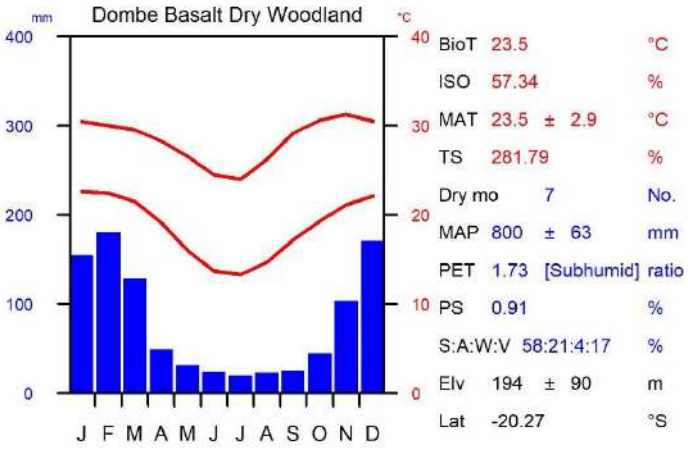
Shrubby species and climbers include *Cissus cornifolia, Combretum mossambicense, Dalbergia abutilifolia*, *Dichrostachys cinerea subsp. africana, Flueggea virosa* subsp. *virosa, Grewia bicolor, Kraussia floribunda, Maerua parvifolia* (except on heavy clays), *Mystroxylon aethiopicum, Polysphaeria lanceolata, Phyllanthus pinnatus*, and *Rourea orientalis*.

Herbaceous species include *Andropogon fastigiatus, Aristida congesta, A. rhiniochloa, A. scabrivalvis, Chloris virgata, Digitaria milanjiana, Eragrostis pallens, E. superba, Panicum maximum, Pogonarthria squarrosa, Schmidtia pappophoroides, Sorghum versicolor* and *Urochloa mosambicensis*. Occasionally there are no dominant grass species and various mixtures of the above could occur. Forbs observed were *Calostephane divaricata, Ceratotheca sesamoides, Kyllinga alba, Tephrosia purpurea* subsp. *leptostachya, T. villosa* subsp. *ehrenbergiana,* and *Waltheria indica.*

Abiotic environment and climate

Altitude range of 55 to 430 m asl with a mean of 194 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 52.2% while the similarly measured clay content is 28.9%. Soil pH is 6.2.

Precipitation during driest quarter is 33.9 mm.



Species of Conservation Importance: none recorded.

Photographic credit 7 km S.E. of Algueirao, S. of Espungabera, Manica Province. photo: J. Burrows.

RLE Assessment

Assessment Summary

This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 36.42% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 135 10 x 10 km grid cells and an EOO of 12955.94 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.02% of the current distribution faces >90 percent degradation severity, 1.41% of the distribution faces >70 percent degradation severity, and 38.46% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

MONAPO KLIPPE DRY WOODLAND

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Mata seca dos rochedos de Monapo
Biome Savannas and grasslands (T4)
Functional group Trophic savannas (T4.1)
Regional Ecosystem Zambezian Savanna

Description

Mixed deciduous woodland on the Monapo Klippe geological intrusion, rich in phosphates.

Distribution

Limited to Mozambique, occurring in a large circle between Namialo, Monapo and Netia, Nampula Province.

Characteristic native biota

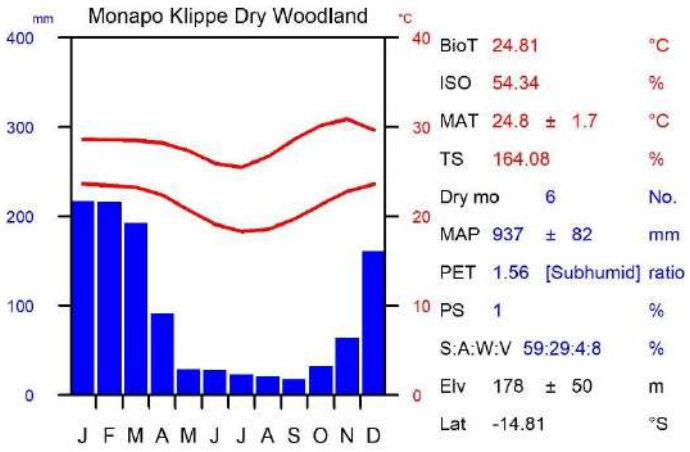
The conspicuous trees of this small vegetation type are *Adansonia digitata, Cordyla africana, Ficus spp.* (*bussei, sycomorus, usambarensis, sansibarica* subsp. *sansibarica), Millettia stuhlmannii, Sterculia appendiculata* and *Tamarindus indica*. Other trees recorded are *Acacia nigrescens, A. polyacantha* subsp. *campylacantha, Albizia glaberrima* var. *glaberrima* (riverine), *A. harveyi, A. versicolor, Brachystegia allenii, Cussonia zimmermannii, Dalbergia boehmii, D. melanoxylon, Dombeya shupangae, Erythrophleum africanum, Parkia filicoidea* (riverine), *Pericopsis angolensis, Philenoptera bussei, P. violacea, Terminalia* (*Pteleopsis*) *barbosae, Sorindeia madagascariensis, Strychnos madagascariensis, Vitex payos* var. *glabrescens,* and *Xeroderris stuhlmannii.*

Smaller trees, shrubs and lianes include *Annona senegalensis, Baphia massaiensis, Bauhinia petersiana, Buchnerodendron lasiocalyx, Cadaba kirkii, Dalbergia fischeri, Entada stuhlmannii, Maerua juncea* subsp. *juncea, Millettia mossambicensis, M. usaramensis, Olax dissitiflora, Rinorea elliptica* and *Rourea orientalis.*

Abiotic environment and climate

Altitude range of 83 to 290 m asl with a mean of 178 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 58.5% while the similarly measured clay content is 26.5%. Soil pH is 6.3.

Precipitation during driest quarter is 26.1 mm.



Species of Conservation Importance.

Endemic Plant Species

Terminalia (*Pteleopsis*) *barbosae* [E].

Threatened Plant Species

Terminalia (*Pteleopsis*) *barbosae* [VU].

RLE Assessment

Assessment Summary

This ecosystem has a highly restricted distribution, with large historical declines and evidence of continuing recent declines. **Critically Endangered**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused an 80.48% decline since 1750. Endangered

Criterion B: This ecosystem has an AOO of 22 10 x 10 km grid cells and an EOO of 1618.2 km2. It has undergone substantial historical decline, and there is evidence that deforestation & other threats are leading to continuing decline. Critically Endangered

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 1.73% of the current distribution faces >90 percent degradation severity, 10.2% of the distribution faces >70 percent degradation severity, and 83.11% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

RIFT VALLEY LOWLAND WOODLAND

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Mata das terras baixas do vale do Rift
Biome Savannas and grasslands (T4)
Functional group Trophic savannas (T4.1)
Regional Ecosystem Zambezian Savanna

Description

Deciduous woodlands on flat or gently undulating terrain. Generally on heavy black soils. Usually comprised of mopane woodland or an open tree savanna of *Acacia nigrescens,* sometimes with *Sclerocarya birrea* (Marula) dominant. On slopes bordering Rio Urema lowlands.

Distribution

Along the Rift Valley from Caia on the Zambezi River, southwards to just east of Nhamatanda, Sofala Province. Confined to Mozambque.

Characteristic native biota

The characteristic trees of this type are *Acacia nigrescens, Acacia robusta, Adansonia digitata, Borassus aethiopum, Combretum adenogonium, Combretum imberbe, Dalbergia melanoxylon, Hyphaene petersiana, Kigelia africana, Sclerocarya birrea* subsp. *caffra*, and *Sterculia appendiculata*, forming a mosaic with patches of *Colophospermum mopane* woodland. Termite mounds support thickets of *Berchemia discolor, Capparis* spp., *Diospyros mespiliformis, Markhamia zanzibarica, Tamarindus indica, Thilachium africanum* and *Xeroderris stuhlmannii.*

The grass layer is dominated by *Eriantha digitaria, Panicum maximum,* and *Urochloa mosambicensis.*

This vegetation unit is further subdivided up into plant communities (Stalmans & Beilfuss 2008).

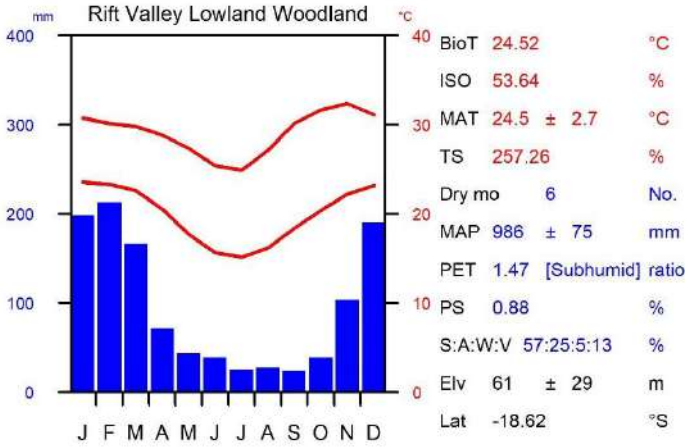
- Short Open to Closed Pan Grassland
- Tall Setaria Floodplain Grassland
- *Hyphaene/Borassus/Phoenix* Open to Closed Tall Palm Veld
- *Colophospermum mopane* Closed Woodland
- *Piliostigma thonningii – Borassus aethiopicum* Closed Woodland / Dry Forest.
- *Dichrostachys cinerea* Tall/High Closed Shrubland

- *Dalbergia melanoxylon* Low Closed Woodland
- *Acacia xanthophloea* Open to Closed, Tall Woodland
- *Acacia* Sparse to Open Woodland with Saline Grassland
- *Acacia-Combretum* Open to Closed, Short to Tall Woodland
- Short to Tall Dry Forest/Thicket

Abiotic environment and climate

Altitude range of 12 to 150 m asl with a mean of 61 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 54.8% while the similarly measured clay content is 26.6%. Soil pH is 6.3.

Precipitation during driest quarter is 50.5 mm.



Species of Conservation Importance

Endemic Plant Species

Acacia torrei [NE], *Celosia pandurata* [E], *Cordia stuhlmannii* [E], *Erythrococca zambesiaca* [NE*], *Vepris myrei* [NE].

Threatened Plant Species

Cordia stuhlmannii [VU], *Erythrococca zambesiaca* [VU*], *Vepris myrei* [NE].

Photographic credits *top*: outside the northern boundary of Gorongosa National Park. photo: M. Lotter; Gorongosa National Park, Sofala Province. photo: M. Stalmans.

RLE Assessment

Assessment Summary

This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 26.67% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 116 10 x 10 km grid cells and an EOO of 17728.64 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.45% of the current distribution faces >90 percent degradation severity, 2.91% of the distribution faces >70 percent degradation severity, and 31.5% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

SAVE LOWLAND DRY WOODLAND

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Mata seca das terras baixas do Save

Biome Savannas and grasslands (T4)

Functional group Trophic savannas (T4.1)

Regional Ecosystem Zambezian Savanna

Description

Mixed deciduous woodland which is a mosaic of mainly acacia woodland on heavier soils, with areas of mixed woodland on sands, and isolated clumps of dry forest on moister soils or on rocky outcrops.

Distribution

Limited to Mozambique, mainly north of the Save River, between Sofala (town) in the north and Save River valley in the south. Occurring in Inhambane, Manica and Sofala Provinces.

Characteristic native biota

The most common formation is an open tree savanna dominated by *Acacia* (A. *gerrardii, A. grandicornuta, A. nigrescens, A. nilotica* subsp. *kraussiana, A. robusta* var. *usambarensis, A. senegal* var. *rostrata, A. welwitschii* subsp. *delagoensis)*, with *Adansonia digitata, Albizia anthelmintica, A. forbesii, Boscia foetida* var. *rehmanniana, Cleistochlamys kirkii, Combretum apiculatum, C. fragrans, C. hereroense, C. imberbe, Commiphora africana, Crossopteryx febrifuga, Dalbergia melanoxylon, Dichrostachys cinerea* subsp. *nyassana, Diospyros loureiriana* subsp. *loureiriana, Diplorhynchus condylocarpon, Garcinia livingstonei, Grewia bicolor, G. hornbyi, Gymnosporia senegalensis, Kigelia africana, Hyphaene coriacea, Maerua angolensis, M. kirkii, Margaritaria discoidea, Ormocarpum trichocarpum, Ozoroa obovata, Philenoptera violacea, Senna petersiana, Spirostachys africana, Strychnos madagascariensis, Terminalia prunioides, Xeroderris stuhlmannii* and *Ximenia americana* subsp. *microphylla.* Within this association also occur areas largely dominated by *Colophospermum mopane*, although rarely occurring as pure stands.

Small patches of dry forest on rocky outcrops or in moister areas may support species such as *Berchemia discolor, Kirkia acuminata, Mimusops obtusifolia, Pappea capensis, Strychnos decussata, S. potatorum, Tamarindus indica,* with smaller shrubs and understorey species being *Bullockia setiflora, Euclea natalensis, Gardenia resiniflua, Maerua parvifolia, Monanthotaxis buchananii, Monodora junodii* var. *junodii, Pavetta gracillima, Psychotria kirkii, Thilachium africanum, Uvaria gracilipes, Vepris carringtoniana,* and *V. reflexa.*

Within this area, on somewhat higher ground and on deeper sands occur patches of mixed miombo with *Brachystegia boehmii, B. spiciformis* and *Julbernardia globiflora*, to which is added *Albizia versicolor, Amblygonocarpus andongensis, Artabotrys brachypetalus, Brackenridgea zanguebarica, Burkea africana, Catunaregam taylori, Combretum apiculatum, C. collinum, C. hereroense, C. molle, C. zeyheri, Crossopteryx febrifuga, Dalbergia melanoxylon, D. nitidula, D. obovata, Erythrina livingstoniana, Ficus bussei, Grewia inaequilatera, Holarrhena*

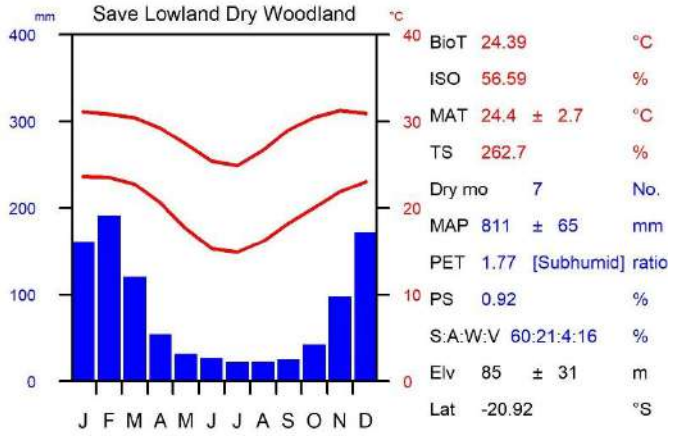
pubescens, Lannea discolor, Hymenocardia ulmoides, Millettia stuhlmannii, Monanthotaxis buchananii, Olax dissitiflora, Parinari curatellifolia, Piliostigma thonningii, Pseudolachnostylis maprouneifolia, Psorospermum febrifugum, Pteleopsis myrtifolia, Pterocarpus angolensis, Rourea orientalis, Sclerocarya birrea subsp. *caffra, Securidaca longepedunculata, Strychnos madagascariensis, S. spinosa, Terminalia sericea, Vangueria infausta, Vitex ferruginea, V. payos* var. *glabrescens, Xeroderris stuhlmannii* and *Ximenia caffra.*

Soft shrubs and herbaceous species recorded from this vegetation type are *Agathisanthemum bojeri, Aneilema hockii* subsp. *hockii, Asparagus cooperi, A. nelsii, A. petersianus, Blepharis gazensis, Ceropegia ubomboensis, Cienfuegosia hildebrandtii, Commelina erecta* subsp. *livingstonii, Crotalaria monteiroi,* and *Nicolasia nitens.* Grass data are lacking.

Abiotic environment and climate

Altitude range of 25 to 180 m asl with a mean of 85 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 61.5% while the similarly measured clay content is 22.8%. Soil pH is 6.3.

Precipitation during driest quarter is 35.6 mm.



Species of Conservation Importance

Endemic Plant Species

Ozoroa gomesiana [E], *Vepris myrei* [NE].

Threatened Plant Species

Ozoroa gomesiana [VU], *Vepris myrei* [EN].

Photographic credits *left*: Save Lowland Dry Woodland just north of the Save River, Sofala Province. photo: A. de Castro; *right*: just south of the Save River, Zinave National Park, Inhambane Province. photo: M. Stalmans.

RLE Assessment

Assessment Summary

This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 3.72% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 153 10 x 10 km grid cells and an EOO of 15127.37 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0% of the current distribution faces >90 percent degradation severity, 0.19% of the distribution faces >70 percent degradation severity, and 9.03% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

SONGO GRANITE DRY WOODLAND

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Mata seca em granito do Songo
Biome Savannas and grasslands (T4)
Functional group Trophic savannas (T4.1)
Regional Ecosystem Zambezian Savanna

Description

A mixed dry deciduous woodland typified by *Colophospermum mopane* and *Julbernardia globiflora*, as well as the genera *Acacia, Albizia, Brachystegia, Combretu*m and *Commiphora.*

Distribution

Limited to north-western Mozambique in Tete Province, centred around the town of Songo, and to the north as far as Cassamandora.

Characteristic native biota

The miombo component of *Julbernardia* and *Brachystegia* (*B allenii, B. boehmii, B. floribunda, B. microphylla, B. spiciformis, B. torrei, B. utilis*) is often scattered, occasionally dominant. Trees are *Acacia* (*ataxacantha, gerrardii, goetzei* subsp. *goetzei, nigrescens, nilotica* subsp. *kraussiana, polyacantha* subsp. *campylacantha, senegal* var. *senegal* and var. *leiorhachis, sieberiana* var. *sieberiana, tortilis* var. *spirocarpa*), *Afzelia quanzensis, Albizia anthelmintica, A. brevifolia, A. harveyi, A. tanganyicensis, A. zimmermannii, Bolusanthus speciosus, Boscia mossambicensis, Burkea africana, Cassia abbreviata* subsp. *beareana, Cladostemon kirkii, Cleistochlamys kirkii, Combretum adenogonium, Combretum apiculatum* subsp. *leutweinii, Commiphora africana, C. caerulea, C. edulis, C. marlothii, C. mossambicensis, Crossopteryx febrifuga, Dalbergia boehmii, D. nitidula, D. melanoxylon, Dalbergiella nyassae, Diospyros kirkii, D. natalensis, D. senensis, D. squarrosa, Euphorbia ingens, Faurea saligna, Gyrocarpus americanus, Markhamia zanzibarica, Olax dissitiflora, Parinari curatellifolia, Pericopsis angolensis, Philenoptera bussei, Pseudolachnostylis maprouneifolia, Pterocarpus angolensis, P. brenanii, P. chrysothrix, P. lucens* subsp. *antunesii, P. rotundifolius* subsp. *polyanthus, Sterculia quinqueloba, Swartzia madagascariensis, Xeroderris stuhlmannii,* and *Ziziphus mauritiana.*

Climbers are *Adenia gummifera, Artabotrys brachypetalus, Capparis sepiaria* subsp. *subglabra, Dalbergia arbutifolia, D. fischeri, Dioscorea prehensilis, Entada chrysostachys, Pristimera andongensis* var. *volkensii,* and *Reissantia buchananii.*

Small trees and woody shrubs include *Abrus precatorius* subsp. *africanus, Annona senegalensis, Bauhinia petersiana, B. tomentosa, Cadaba kirkii, Combretum elaeagnoides, Coptosperma zygoon, Cordia goetzei, C. grandicalyx, C. pilosissima, Dalbergia melanoxylon, Dichrostachys cinerea* var. *plurijuga* and subsp. *nyassana, Dombeya kirkii, Elephantorrhiza goetzei, Empogona kirkii, Euclea schimperi, Flacourtia indica, Grewia lepidopetala, Gymnosporia pubescens, Hexalobus monopetalus* var. *obovatus, Maerua triphylla* var. *pubescens, Monanthotaxis obovata, Monodora junodii* var. *junodii, M. stenopetala, Mundulea sericea, Ormocarpum zambesianum, Pavetta gardeniifolia, P. klotzschiana, Solanum tettense* var. *tettense, Turraea nilotica, Tylosema fassoglensis, Ximenia caffra* var. *caffra,* and *Xylotheca tettensis* var. *macrophylla.*

Small shrubs and herbaceous species recorded are *Abutilon angulatum, A. ramosum, Aeschynomene abyssinica, Aloe cameronii* var. *cameronii, Barleria spinulosa, Cissus cornifolia, Cleome gynandra, Crotalaria cephalotes, C. laburnifolia* subsp. *laburnifolia, C. microcarpa, C. pallida, Elytraria acaulis, Eminia antennulifera, Eureiandra eburnean,*

Hermannia glanduligera, H. modesta, Hibiscus allenii, H. caesius, H. cannabinus, H. engleri, H. mastersianus, H. micranthus, H. vitifolius, Hypoestes forskaolii, Indigofera lupatana, I. ormocarpoides, Melhania forbesii, Nelsonia smithii, Neuracanthus africanus subsp. *africanus, Pavonia burchellii, P. patens, Rhynchosia resinosa, R. sublobata, Sida urens, Stylochaeton milneanum, Tephrosia acaciifolia, T. lurida, T. noctiflora, T. reptans, T. rhodesica*, and *Tinnea rhodesica.*

Grasses recorded are *Andropogon gayanus, A. schirensis, Aristida adscensionis, Brachiaria deflexa, Dactyloctenium giganteum, Diandrochloa namaquensis, Echinochloa colona, Enteropogon macrostachyus, Eragrostis aspera, E. cilianensis, E. rotifer, Hackelochloa granularis, Heteropogon contortus, Hyperthelia dissoluta, Leptocarydion vulpiastrum, Loudetia flavida, Melinis repens, Pennisetum polystachion, P. unisetum, Schmidtia pappophoroides, Setaria trinervia, Stereochlaena cameronii, Themeda triandra*, and *Zonotriche inamoena.*

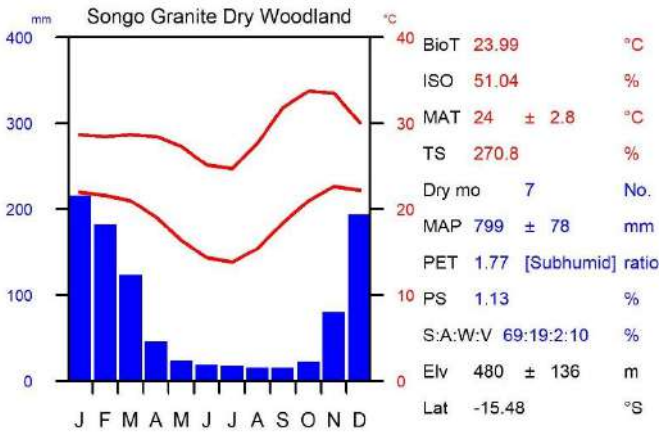
Riparian forest elements are *Acacia galpinii, A. versicolor, Berchemia discolor, Combretum microphyllum, C. mossambicense, Cordyla africana, Diospyros mespiliformis, Faidherbia albida, Ficus bussei, F. sycomorus* subsp. *sycomorus, Garcinia livingstonei, Homalium abdessammadii, Lecaniodiscus fraxinifolius, Maclura africana, Philenoptera violacea, Phyllanthus reticulatus, Strychnos decussata, Tamarindus indica, Trichilia emetica* and the shrubby species of *Sesbania* (*bispinosa* var. *bispinosa, macrantha, sesban*).

Rocky hills are typified by the trees *Albizia tanganyicensis, Brachystegia microphylla, B. torrei, Commiphora marlothii, C. mollis, Diospyros natalensis, Entandrophragma caudatum, Erythrina abyssinica, Ficus abutilifolia, F. ingens, F. tettensis, Gyrocarpus americanus, Hymenodictyon floribundum, Pouzolzia mixta, Sterculia africana*, and *S. quinqueloba.*

Abiotic environment and climate

Altitude range of 205 to 920 m asl with a mean of 480 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 60.0% while the similarly measured clay content is 23.0%. Soil pH is 6.4.

Precipitation during driest quarter is 6.5 mm.



Species of Conservation Importance: none recorded.

Photographic credits *left*: hills near Cahora Bassa Dam. photo: J. Burrows; *right*: hills around Cahora Bassa Dam wall, Tete Province. photo: M. Lotter.

RLE Assessment

Assessment Summary	Assessment Information
This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**	**Criterion A:** Expansion of urban areas, agriculture & deforestation has caused a 18.86% decline since 1750. Least Concern **Criterion B:** This ecosystem has an AOO of 61 10 x 10 km grid cells and an EOO of 5926.44 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern **Criterion C:** Not evaluated **Criterion D:** Degradation assessment shows that 0.49% of the current distribution faces >90 percent degradation severity, 2.82% of the distribution faces >70 percent degradation severity, and 30.62% of the distribution faces >50 percent degradation severity. Least Concern **Criterion E:** Not evaluated

STORMBERG DRY WOODLAND

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Mata seca em rochas de stormberg
Biome Savannas and grasslands (T4)
Functional group Trophic savannas (T4.1)
Regional Ecosystem Zambezian Savanna

Description

Mixed deciduous woodland.

Distribution

North of the Save River, to the north-west of Massangena and crossing over into Zimbabwe. Occurring in Gaza and Manica Provinces.

Characteristic native biota

Acacia nigrescens, A. welwitschii subsp. *delagoensis, Adansonia digitata, Afzelia quanzensis, Androstachys johnsonii, Balanites maughamii, Berchemia discolor, Boscia angustifolia* var. *corymbosa, Brachystegia torrei, Colophospermum mopane*, *Combretum apiculatum, C. imberbe, C. zeyheri, Diospyros loureiriana* subsp. *loureiriana, D. mespiliformis, Drypetes mossambicensis, Entandrophragma caudatum, Gyrocarpus americanus, Kigelia africana, Kirkia acuminata, Julbernardia globiflora, Lannea schweinfurthii* var. *stuhlmannii, Maerua kirkii, Millettia stuhlmannii, Philenoptera bussei, P. violaceae, Pseudolachnostylis maprouneifolia, Pteleopsis myrtifolia, Spirostachys africana, Strychnos madagascariensis, Terminalia sericea*, and *Xeroderris stuhlmannii.* Also common is the liane *Artabotrys brachypetalus*, often forming clumps.

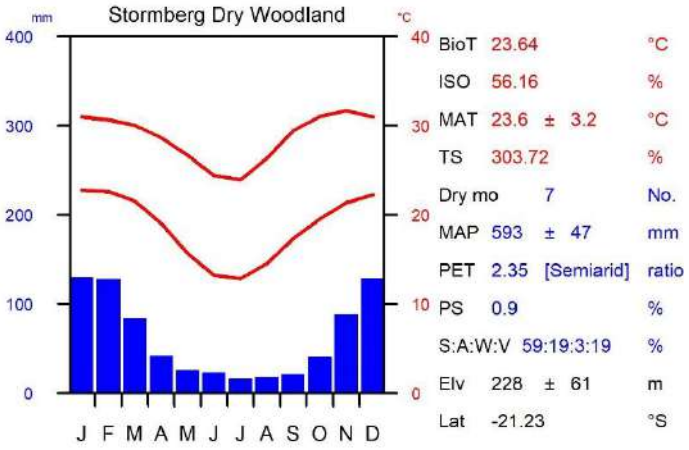
Species in the shrub layer almost always recorded were *Adenium multiflorum, Anisotes rogersii* (a sub-shrub), *Capparis tomentosa, Commiphora edulis* subsp. *edulis, Cordia grandicalyx, Euphorbia cooperi* var. *cooperi, Flueggea virosa* subsp. *virosa, Millettia usaramensis* subsp. *australis*, and *Sterculia rogersii*. Species typically found on rocky hillsides and rarely recorded on flat ground were *Afzelia quanzensis, Cissus cornifolia, Combretum padoides, Elephantorrhiza goetzei* subsp. *goetzei, Entandrophragma caudatum* and *Kirkia acuminata*. Species more often found on flat land on granophyre terrain were *Acacia welwitschii* subsp. *delagoensis.*

Dominant grass species on steep, rocky ground are *Digitaria milanjiana, Enneapogon cenchroides, Heteropogon contortus, Melinis repens, Panicum maximum* and *Urochloa mosambicensis*. Occasionally dominant grasses are *Aristida rhiniochloa, Brachiaria deflexa* and *Eragrostis cylindriflora. Danthoniopsis dinteri* is dominant when the rock cover is high. Frequently present forbs are *Barleria spinulosa, Polydora poskeana* and *Waltheria indica* and, less frequent, *Sphaeranthus peduncularis*. On flat ground the most commonly dominant grass is *Digitaria milanjiana*. Locally dominant species are *Digitaria eriantha, Enneapogon cenchroides, Eragrostis cylindriflora, Melinis repens, Perotis patens, Pogonarthria squarrosa* and *Urochloa mosambicensis*. Noticeable forbs are *Basananthe pedata, Barleria affinis, Hibiscus engleri, Melhania acuminata, Merremia kentrocaulos, Polydora poskeana, Sida ovata, Solanum campylacanthum, Tricliceras tanacetifolium,* and *Waltheria indica.*

Abiotic environment and climate

Altitude range of 125 to 380 m asl with a mean of 228 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 56.7% while the similarly measured clay content is 24.1%. Soil pH is 6.4.

Precipitation during driest quarter is 20 mm.



Species of Conservation Importance: none recorded.

RLE Assessment

Assessment Summary

This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 12.65% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 47 10 x 10 km grid cells and an EOO of 3754.73 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0% of the current distribution faces >90 percent degradation severity, 0.67% of the distribution faces >70 percent degradation severity, and 17.34% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

TETE GABBRO DRY WOODLAND

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Mata seca em rochas de gabro de Tete
Biome Savannas and grasslands (T4)
Functional group Trophic savannas (T4.1)
Regional Ecosystem Zambezian Savanna

Description

Mixed deciduous woodland on gabbro.

Distribution

Between Chiodze Ponte and Mecunga in Tete Province. Limited to Mozambique.

Characteristic native biota

Trees: *Acacia hockii, A. nilotica* subsp. *kraussiana, A. polyacantha* subsp. *campylacantha, A. senegal* var. *leiorhachis, A. tortilis* subsp. *spirocarpa, Afzelia quanzensis, Albizia brevifolia, A. harveyi, Cleistanthus schlechteri* var. *pubescens, Colophospermum mopane, Commiphora edulis, Dichrostachys cinerea* var. *plurijuga, Diospyros kirkii, D. mespiliformis, Dombeya rotundifolia, Elaeodendron schlechteri, Guibourtia conjugata, Kirkia acuminata, Manilkara mochisia, Peltophorum africanum, Piliostigma thonningii, Pterocarpus brenanii, Sclerocarya birrea* subsp. *caffra, Senna singueana, Sterculia appendiculata, Trichilia capitata, Vitex petersiana*, and *Xeroderris stuhlmannii.*

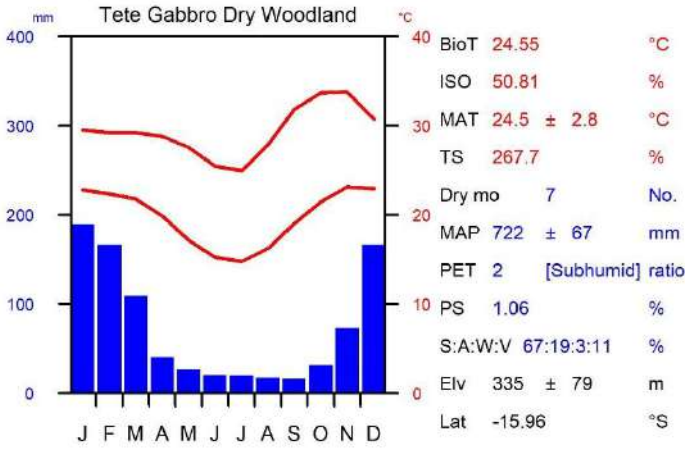
Shrubs and lianes recorded are *Capparis erythrocarpos* var. *rosea, Catunaregam pentandra, Dalbergia arbutifolia, Maerua scandens, Tapiphyllum velutinum, Tylosema fassoglensis,* and *Jasminum fluminense.*

The riparian fringe contains *Acacia robusta* var. *clavigera, Albizia glaberrima, Faidherbia albida, Ficus sycomorus* subsp. *sycomorus, Khaya anthotheca*, and *Trichilia emetica.*

Abiotic environment and climate

Altitude range of 145 to 565 m asl with a mean of 335 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 59.6% while the similarly measured clay content is 24.6%. Soil pH is 6.7.

Precipitation during driest quarter is 13 mm.



Species of Conservation Importance: none recorded.

Photographic credits *left*: Tete Gabbro Dry Woodland, deciduous in November, Tete Province. photo: J. Burrows; *right*: between Tete and Massano, Tete Province. photo: W. McCleland.

RLE Assessment

Assessment Summary

This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 24.98% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 83 10 x 10 km grid cells and an EOO of 7922.46 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.37% of the current distribution faces >90 percent degradation severity, 6.44% of the distribution faces >70 percent degradation severity, and 42% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

MAPUTO ALLUVIAL VEGETATION

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Vegetação aluvial de Maputo

Biome Savannas and grasslands (T4)

Functional group Trophic savannas (T4.1)

Regional Ecosystem Subtropical Alluvial Savanna

Description

Alluvial floodplains with seepage areas, usually with sparse to dense riparian woodland with flooded (hygrophilous) grasslands along large drainage lines.

Distribution

Large floodplains and drainage lines of the Gaza and Maputo Provinces. Extending into South Africa and Eswatini.

Characteristic native biota

An extensive vegetation type and very well-collected, typically dominated by the genus *Acacia* (*A. luederitzii* var. *retinens, A. robusta* subsp. *clavigera, A. schweinfurthii* var. *schweinfurthii, A. senegal* var. *rostrata, A. welwitschii* subsp. *delagoensis, A. xanthophloea*). Other trees recorded are *Albizia adianthifolia, A. anthelmintica, A. petersiana* subsp. *evansii, A. versicolor, Boscia mossambicensis, Breonadia salicina, Bridelia micrantha, Combretum imberbe, Cordyla africana, Diospyros mespiliformis, Elaeodendron schlechterianum, Erythrophleum suaveolens, Faidherbia albida, Ficus bubu, F. lutea, F. polita* subsp. *polita, F. sansibarica* subsp. *sansibarica, F. stuhlmannii, F. sycomorus* subsp. *sycomorus, Kigelia africana, Lannea schweinfurthii, Maerua angolensis, Mimusops obtusifolia, Morus mesozygia, Philenoptera violacea, Shirakiopsis elliptica, Sideroxylon inerme, Spirostachys africana, Syzygium cordatum, Trichilia emetica, Voacanga thouarsii, Xanthocercis zambesiaca,* and *Ziziphus mauritiana*. The palms *Hyphaene coriacea* and *Phoenix reclinata* are widespread, while the near-endemic *Raphia australis* occurs in this vegetation type near Maputo.

Small trees and shrubs recorded are *Acokanthera oppositifolia, Alchornea laxiflora, Balanites pedicellaris, Bridelia carthartica* subsp. *cathartica, Carissa bispinosa* subsp. *bispinosa, Combretum microphyllum, C. mossambicense, Croton madandensis, C. megalobotrys, Dichrostachys cinerea* subsp. *africana* var. *africana, Dichrostachys cinerea* subsp. *argillicola* var. *hirtipes, D. cinerea* subsp. *nyassana, Euclea divinorum, Ficus capreifolia, Flueggea virosa, Gymnosporia senegalensis, Jasminum fluminense, Lycium schizocalyx, Maclura africana, Maerua juncea* subsp. *crustata, Oncoba spinosa, Phyllanthus reticulatus, Salvadora angustifolia, S. persica, Schotia capitata, Sesbania leptocarpa* var. *leptocarpa, S. sesban* var. *nubica, Thilachium africanum, Ximenia caffra* var. *natalensis,* and *Zanthoxylum humile.*

Climbers and lianes include *Capparis fascicularis, C. tomentosa, Dalbergia armata, D. obovata, Entada rheedii, Grewia caffra,* and *Pisonia aculeata.*

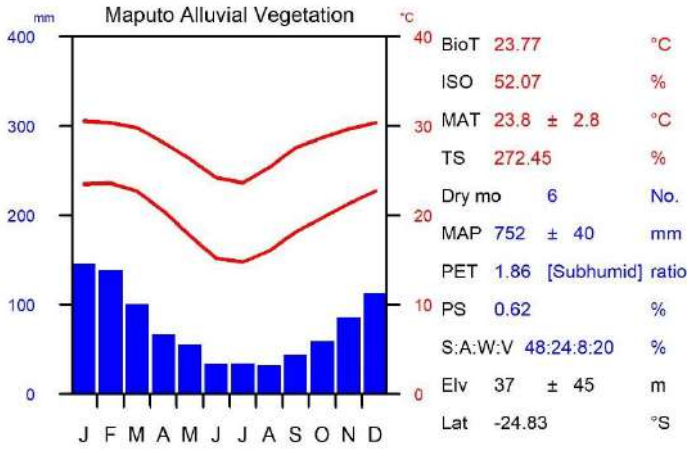
Shrublets and herbaceous species recorded are *Abutilon austro-africanum, Acalypha indica, A. segetalis, Agathisanthemum bojeri, Alternanthera sessilis, Amaranthus praetermissus, Aneilema aequinoctiale, Anisotes formosissimus, Asystasia gangetica, Barleria lancifolia, Blepharis acanthodioides, Brachystelma gracile, Celosia trigyna, Ceropegia sandersonii, Commelina benghalensis, Crotalaria burkeana, C. dura* subsp. *mozambica, C. laburnifolia, Dicliptera elliotii, Drimia elata, Eriosema psoraleoides, Gossypium herbaceum* subsp. *africanum, Hermannia micropetala, Justicia flava, Kewa bowkeriana, Lotononis bainesii, Melanthera scandens* subsp. *dregei, Ocimum canum, Pentarrhinum insipidum, Phyllanthus maderaspatensis, Rhynchosia sublobata Solanum campylacanthum, Tritonia moggii, Vahlia capensis* var. *longifolia, Vigna unguiculata* var. *dekindtiana*, and *Zaleya pentandra.*

Grasses and sedges are dominant in some areas of these often moist lowlands and include *Anthephora pubescens, Bolboschoenus glaucus, Bothriochloa bladhii B. insculpta, Brachiaria arrecta, B. eruciformis, B. reptans, Cenchrus pauciflorus, Chloris mossambicensis, C. pycnothrix, C. virgata, Cymbopogon plurinodis, Cynodon dactylon, Cyperus articulatus, C. corymbosus, C. difformis, C. distans, C. dives, C. fastigiatus, C. immensus, C. sexangularis, Dactyloctenium aegyptium, D. geminatum, Dichanthium annulatum* var. *papillosum, Diplachne fusca, Echinochloa jubata, E. pyramidalis, E. stagnina, Elionurus muticus, Enneapogon cenchroides, Eragrostis heteromera, E. trichophora, Hemarthria altissima, Hyparrhenia filipendula, Imperata cylindrica, Ischaemum afrum, Leersia hexandra, Melica minuta, Panicum coloratum, P. deustum, P. kalaharense, P. maximum, Paspalidium obtusifolium, Paspalum scrobiculatum, Phragmites australis, Sehima galpinii, Setaria incrassata, S. sphacelata, Sorghum arundinaceum, Sporobolus consimilis, S. fimbriatus, S. ioclados, S. nitens, S. pyramidalis, S. virginicus, Schoenoplectiella supina,* and *Urochloa mosambicensis*.

Abiotic environment and climate

Altitude range of 2 to 200 m asl with a mean of 37 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 51.2% while the similarly measured clay content is 29.7%. Soil pH is 6.5.

Precipitation during driest quarter is 60.8 mm.



Species of Conservation Importance

Endemic Plant Species

Adenopodia schlechteri [E], *Allophylus mossambicensis* [E], *Dicliptera quintasii* [E], *Stylochaeton natalensis* subsp. *maximus* [NE], *Tephrosia forbesii* subsp. *forbesii* [E].

Threatened Plant Species

Adenopodia schlechteri [VU], *Allophylus mossambicensis* [VU], *Dicliptera quintasii* [VU], *Nesaea gazensis* [VU*], *Tephrosia forbesii* subsp. *forbesii* [VU].

Photographic credits *top & middle*: Maputo Special Reserve; photos: M. Stalmans. *bottom*: Magude floodplain, Maputo Province. photo: M. Lotter.

RLE Assessment

Assessment Summary

This ecosystem has declined by more than half since 1750 due to expansion of agriculture, urban areas and deforestation. **Vulnerable**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 57.46% decline since 1750. Vulnerable

Criterion B: This ecosystem has an AOO of 184 10 x 10 km grid cells and an EOO of 62249.13 km2. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 2.48% of the current distribution faces >90 percent degradation severity, 18.18% of the distribution faces >70 percent degradation severity, and 72.98% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

SAVE ALLUVIAL VEGETATION

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Vegetação aluvial do Save

Biome Savannas and grasslands (T4)

Functional group Trophic savannas (T4.1)

Regional Ecosystem Subtropical Alluvial Savanna

Description

Alluvial floodplains with seepage areas, usually with sparse to dense riparian woodland with flooded (hygrophilous) grasslands along large drainage lines.

Distribution

Floodplain of the Save River and its tributaries on the boundary between Gaza, Inhambane, Manica and Sofala Provinces.

Characteristic native biota

The riparian forest along the Save River is typically composed of *Acacia xanthophloea, Albizia glaberrima* subsp. *glabrescens, A. versicolor, Berchemia discolor, Combretum imberbe, Diospyros mespiliformis, Euphorbia tirucalli, Faidherbia albida, Ficus sycomorus* subsp. *sycomorus, Kigelia africana, Newtonia hildebrandtii* var. *pubescens, Philenoptera violacea, Phoenix reclinata, Spirostachys africana, Sterculia appendiculata, Xanthocercis zambesiaca,* and *Xeroderris stuhlmannii*. Smaller understorey trees and shrubs typically consist *of Azima tetracantha, Capparis tomentosa, Deinbollia xanthocarpa, Grewia bicolor, G. caffra, Lecaniodiscus fraxinifolius, Pappea capensis, Rinorea elliptica*, and *Tricalysia jasminiflora.*

Behind the fringe of gallery forest, on the alluvial levee, extends a dry mixed woodland of varying composition but including *Acacia gerrardii, A. nigrescens, A. nilotica* subsp. *kraussiana, A. tortilis* subsp. *heteracantha, Albizia anthelmintica, Brachystegia torrei, Combretum microphyllum, C. mossambicense, Commiphora africana, Dalbergia melanoxylon, Dichrostachys cinerea* subsp. *nyassana, Diospyros loureiriana* subsp. *loureiriana, Erythrina livingstoniana, Gymnosporia senegalensis, Hyphaene coriacea, H. petersiana, Piliostigma thonningii, Sclerocarya birrea* subsp. *caffra, Senna petersiana, Terminalia prunoides* and *Xylotheca tettensis* var. *tettensis.*

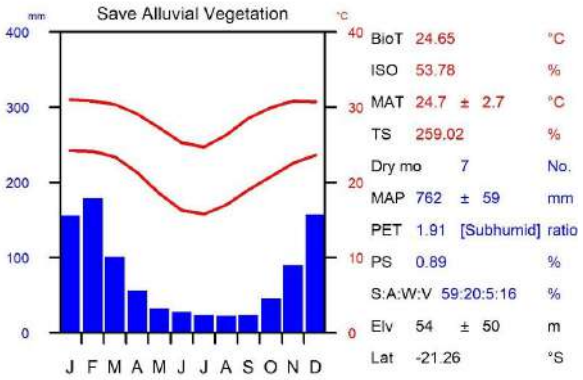
Smaller shrubs and herbaceous species include *Canavalia africana, Cocculus hirsutus, Eriosema psoraleoides, Euphorbia knuthii* subsp. *johnsonii, Gyrodoma hispida, Helichrysum argyrosphaerum, Hibiscus physaloides, H. praeteritus, Lablab purpureus* subsp. *purpureus, Sphaeranthus foliosus, Urena lobata, Trianthema salsoloides* and *Triumfetta rhomboidea.* Graminoids recorded from this type are few but include *Alloteropsis semialata, Coelorachis lepidura, Cyperus atribulbus, Echinochloa haploclada, E. stagnina, Oryza longistaminata, Scleria lithosperma,* and *Sorghum bicolor.*

Wetland species along the river banks and oxbow lakes include *Cyperus* spp., *Jasminum fluminense, Mimosa pigra, Nuxia oppositifolia, Phragmites mauritiana, Phyllanthus reticulatus, Sesbania bispinosa* subsp. *bispinosa,* and *S. sesban.*

Abiotic environment and climate

Altitude range of 3 to 160 m asl with a mean of 54 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 54% while the similarly measured clay content is 26.8%. Soil pH is 6.6.

Precipitation during driest quarter is 31.7 mm.



Species of Conservation Importance

Biogeographic Anomalies

Euphorbia knuthiii subsp. *johnsonii.*

Photographic credits *left*. Save River, on the northern boundary of Zinave National Park; *right*: just south of Save River, Zinave National Park**.** photos: M. Stalmans.

RLE Assessment

Assessment Summary	Assessment Information
This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**	**Criterion A:** Expansion of urban areas, agriculture & deforestation has caused a 15.77% decline since 1750. Least Concern **Criterion B:** This ecosystem has an AOO of 51 10 x 10 km grid cells and an EOO of 8261.27 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern **Criterion C:** Not evaluated **Criterion D:** Degradation assessment shows that 0.13% of the current distribution faces >90 percent degradation severity, 5.7% of the distribution faces >70 percent degradation severity, and 52.15% of the distribution faces >50 percent degradation severity. Least Concern **Criterion E:** Not evaluated

BUZI-PUNGWE ALLUVIAL VEGETATION

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Vegetaçao Aluvial do Buzi-Pungue
Biome Savannas and grasslands (T4)
Functional group Trophic savannas (T4.1)
Regional Ecosystem Tropical Alluvial Savanna

Description

Alluvial floodplains with seepage areas, usually with sparse to dense riparian woodland with flooded (hygrophilous) grasslands along large drainage lines.

Distribution

Limited to the floodplains of the Buzi and Pungwe rivers in Manica and Sofala Provinces.

Characteristic native biota

In the higher reaches of the Buzi River the alluvial vegetation is similar to that of the Save to the south, with the following additional species recorded: *Acacia gerrardii, Cordia sinensis, Hyphaene coriacea, Lannea schweinfurthii, S. appendiculata*, and shrubs and climbers such as *Ancylobotrys petersiana, Capparis sepiaria* var. *subglabra, Cissus cornifolia, Croton madandensis, C. megalobotrys, Gymnosporia buxifolia*, and *Strychnos henningsii.*

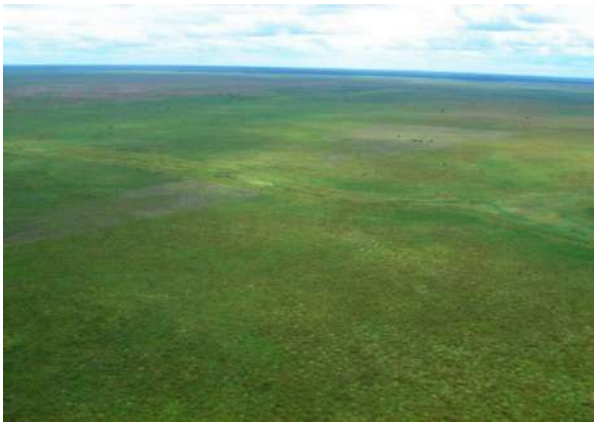
Closer to the coast but still on freshwater, is a sparse fringe of trees and shrubs such as *Antidesma vogelianum, Antidesma rufescens, Barringtonia racemosa, Dichrostachys cinerea* var. *plurijuga, Euphorbia lividiflora, Hibiscus tiliaceus, Hirtella zanzibarica, Maerua brunnescens, Paullinia pinnata* (liane), *Polysphaeria lanceolata,* with numerous riverbank species such as *Acalypha pubiflora, Derris trifoliata, Kanahia laniflora, Jasminum fluminense, Linzia gerberiformis, Ludwigia octovalvis, Luffa aegyptiaca, Melochia corchorifolia, Mimosa pigra, Mucuna pruriens* var. *pruriens, Pentodon pentandrus* var. *minor, Psophocarpus palustris, Rhynchosia sublobata, Sesbania leptocarpa*, and *Sesbania bispinosa* subsp. *bispinosa.*

Softer shrubs and herbaceous species include *Commicarpus plumbagineus, Corchorus olitorius, Drimia altissima, Duosperma quadrangularis, Hibiscus cannabinus, H. praeteritus, Litogyne gariepina, Nidorella microcephala, Striga forbesii, S. pubiflora* and *Trianthema salsoloides.*

Graminoids recorded are *Chrysopogon nigritanus, Coelorachis lepidura, Cyperus atribulbus, Echinochloa haploclada, Echinochloa stagnina, Hemarthria altissima, Ischaemum afrum, Loudetia simplex, Oryza longistaminata, Panicum coloratum, P. maximum, Scleria lithosperma, Setaria incrassata,* and *S. sphacelata* var. *sericea.*

Permanent swamps and lakes are home to, among many others, the aquatic species *Azolla nilotica, Ceratopteris thalictroides, Cyperus papyrus, Neptunia oleracea, Nymphaea lotus, N. nouchali, Nymphoides* spp., *Utricularia stellaris,* and *Typha latifolia.*

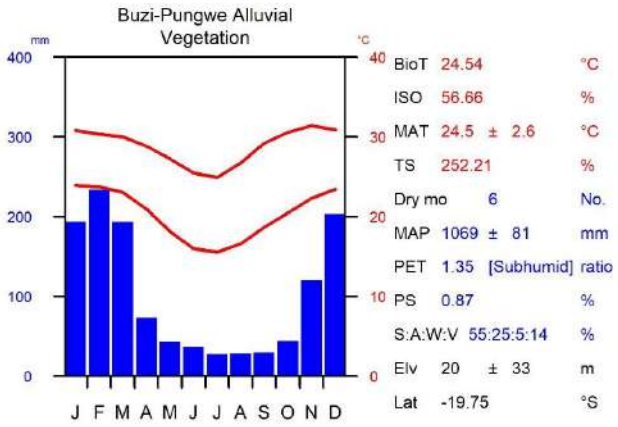
Some higher ground around the town of Buzi (Nova Lusitania) supports a woodland related to Cheringoma Plateau Moist Miombo to the north, with species such as *Afzelia quanzensis, Dalbergia boehmii, Millettia usaramensis, Oxyanthus goetzei, Psychotria pumila* var. *buzica, Pterocarpus angolensis*, and *Sterculia africana.*



Abiotic environment and climate

Altitude range of 4 to 160 m asl with a mean of 20 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 45.7% while the similarly measured clay content is 34.3%. Soil pH is 6.3.

Precipitation during driest quarter is 48.3 mm.



Species of Conservation Importance

Endemic Plant Species

Disperis mozambicensis [E*], *Siphonochilus kilimanensis* [E].

Threatened Plant Species

Disperis mozambicensis [CR*], *Siphonochilus kilimanensis* [VU].

Photographic credits *top, left & right*: aerial views of the Buzi-Pungwe floodplains. photos: M. Stalmans; *bottom*: Revue River, a tributary of the Buzi River. photo: J. Burrows.

RLE Assessment

Assessment Summary	Assessment Information
This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**	**Criterion A:** Expansion of urban areas, agriculture & deforestation has caused a 38.41% decline since 1750. Least Concern **Criterion B:** This ecosystem has an AOO of 78 10 x 10 km grid cells and an EOO of 14151.42 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern **Criterion C:** Not evaluated **Criterion D:** Degradation assessment shows that 1.02% of the current distribution faces >90 percent degradation severity, 9.77% of the distribution faces >70 percent degradation severity, and 48.56% of the distribution faces >50 percent degradation severity. Least Concern **Criterion E:** Not evaluated

RIFT VALLEY FLOODPLAIN WOODED GRASSLAND

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Pradaria arbórea da planicie de inundação do vale do Rift
Biome Savannas and grasslands (T4)
Functional group Trophic savannas (T4.1)
Regional Ecosystem Tropical Alluvial Savanna

Description

The vegetation consists of a mix of mostly open plant communities ranging from pure grasslands to open Acacia xanthophloea and Faidherbia albida woodlands, on alluvial soils. Defined by regular (annual) flooding on heavy clay soils with parts of the landscape being inundated for two or more months.

Distribution

In the central section of the Rift Valley along its north-south axis, between Chitengo and Chire. Occurring in Sofala, Tete and Zambezia Provinces.

Characteristic native biota

Faidherbia albida, Acacia xanthophloea, Combretum imberbe, Hyphaene petersiana, Phoenix reclinata, Echinochloa colona, Vetiveria nigritana, Cynodon dactylon, Digitaria swazilandensis, Leersia hexandra. The following plant communities occur within this vegetation unit (Stalmans & Beilfuss 2008).

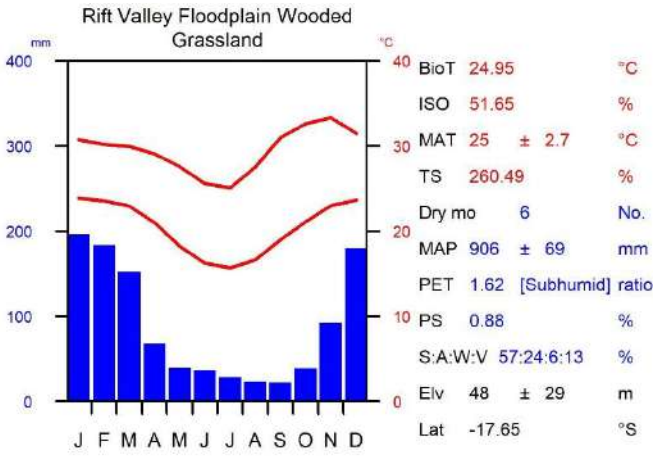
1. Short Open to Closed Pan Grassland 2. Tall Echinochloa-Vetiveria Floodplain Grassland 3. Tall Setaria Floodplain Grassland 4. *Cynodon dactylon – Digitaria swazilandensis* Low Grassland 5. *Hyphaene/Borassus/Phoenix* Open to Closed Tall Palm Veld 6. *Acacia xanthophloea* Open to Closed, Tall Woodland 7. *Faidherbia albida* Open to Closed, Tall Woodland 8. *Acacia-Combretum* Open to Closed, Short to Tall Woodland.



Abiotic environment and climate

Altitude range of 23 to 144 m asl with a mean of 48 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 52.1% while the similarly measured clay content is 30.5%. Soil pH is 6.4.

Precipitation during driest quarter is 41.5 mm.



Species of Conservation Importance: none recorded.

Photographic credits *Left & right*: Urema valley, Gorongosa National Park. *Centre*: Lake Urema, Gorongosa National Park. all photos: M. Stalmans

RLE Assessment

Assessment Summary

This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 29.59% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 97 10 x 10 km grid cells and an EOO of 16345.06 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.44% of the current distribution faces >90 percent degradation severity, 5.14% of the distribution faces >70 percent degradation severity, and 37.61% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

ROVUMA ALLUVIAL VEGETATION

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Vegetação aluvial do Rovuma
Biome Savannas and grasslands (T4)
Functional group Trophic savannas (T4.1)
Regional Ecosystem Tropical Alluvial Savanna

Description

Alluvial floodplains with seepage areas, usually with sparse to dense riparian woodland with flooded (hygrophilous) grasslands along large drainage lines.

Distribution

Floodplain of the lower Rovuma and Messalo rivers and their tributaries in Cabo Delgado Province. Also into Tanzania.

Characteristic native biota

The low alluvial floodplain is dominated by the palms *Borassus aethiopum, Hyphaene compressa, H. coriacea* and *Phoenix reclinata*, with *Acacia gerrardii, A. polyacantha* subsp. *campylacantha, A. rovumae, A. seyal* var. *fistula, A. sieberiana* var. *sieberiana, A. welwitschii* subsp. *delagoensis, Albizia forbesii, Dombeya shupangae, Philenoptera violacea, Syzygium niassense* and *Tamarindus indica* but is mainly covered in tall dense grasses (including *Panicum* cf. *coloratum* and *Setaria incrassata*) and lower woody species such as *Boscia angustifolia* var. *corymbosa, Combretum constrictum, C. mossambicense, C. obovatum, Grewia stuhlmannii, Eriosema psoraleoides* and *Indigofera schimperi.*

Bordering the low floodplain is a higher platform of compacted grey alluvium and conglomerates that support a mosaic of dry woodland and thicket. The following trees have been recorded: *Baphia macrocalyx, Cussonia zimmermannii, Diospyros abyssinica* subsp. *abyssinica, Drypetes reticulata, Hymenaea verrucosa, Manilkara sansibarensis, Millettia stuhlmannii, Mimusops obtusifolia, Pterocarpus angolensis, P. megalocarpus, Rinorea elliptica, Scorodophloeus fischeri, Thespesia mossambicensis*, and *Vitex doniana.*

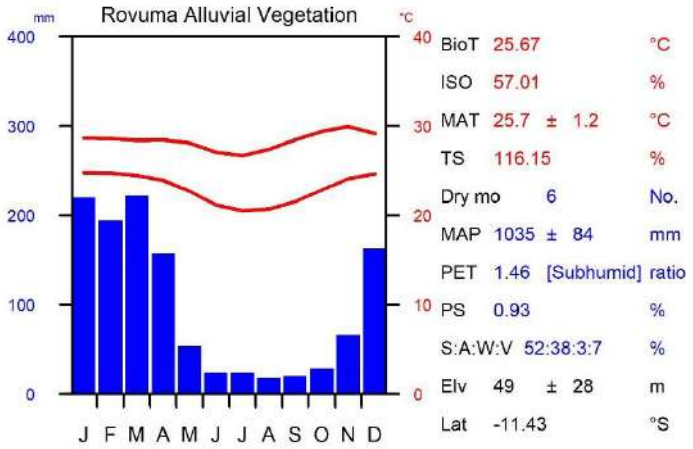
Shrubs, climbers and small trees are represented by *Acacia adenocalyx, A. ataxacantha, Acridocarpus chloropterus, Chassalia umbraticola, Cissus quadrangularis, Cleistochlamys kirkii, Diospyros kabuyeana, Entada stuhlmannii, Hexalobus mossambicensis, Landolphia kirkii, Maerua bussei, M. kirkii, M. triphylla* var. *pubescens, Monanthotaxis trichantha, Olax pentandra, Ormocarpum schliebenii, Oxyanthus zanguebaricus, Pavetta fascifolia, P. macrosepala, Pentarhopalopilia umbellulata, Polysphaeria multiflora, Premna hans-joachimii, Strychnos henningsii, S. xylophylla, Synaptolepis oliveriana,* and *Uvaria kirkii.* Herbaceous species include *Decorsea schlechteri, Desmodium velutinum, Ipomoea violacea*, and *Justicia gorongozana.*

The riverbank vegetation along the Rovuma and Messalo rivers is composed of the trees *Albizia glaberrima* var. *glabrescens, Barringtonia racemosa, Breonadia salicina, Faidherbia albida, Khaya anthotheca, Kigelia africana, Lepisanthes senegalensis, Phoenix reclinata* and *Syzygium niassense*, with shrubby vegetation composed of *Phyllanthus reticulatus, Ficus capreifolia, Mimosa pigra, Persicaria madagascariensis* and *Phragmites mauritiana* with climbers such as *Luffa cylindrica*. The floating aquatic *Pistia stratiotes* is common.

Abiotic environment and climate

Altitude range of 4 to 140 m asl with a mean of 49 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 56.4% while the similarly measured clay content is 25.9%. Soil pH is 6.1.

Precipitation during driest quarter is 20.8 mm.



Species of Conservation Importance

Endemic Plant Species

Pavetta fascifolia [E], *Pavetta macrosepala var. macrosepala* [NE], *Premna hans-joachimii* [NE], *Strychnos xylophylla* [NE], *Stylochaeton tortispathus* [E*], *Vepris allenii* [E].

Threatened Plant Species

Pavetta fascifolia [DD], *Pavetta macrosepala* var. *macrosepala* [VU], *Premna hans-joachimii* [VU], *Strychnos xylophylla* [EN], *Stylochaeton tortispathus* [VU*], *Vepris allenii* [EN].

Biogeographic Anomalies

Ipomoea violacea, Grewia stuhlmannii, Pterocarpus megalocarpus, Scorodophloeus fischeri.

Photographic credits *left*: the confluence of the Rovuma and Nthumbwe rivers; *right*: *Borassus aethiopum* palms on the Messalo River floodplain, Cabo Delgado. photos: J. Burrows.

RLE Assessment

Assessment Summary

This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 20.86% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 52 10 x 10 km grid cells and an EOO of 16960.17 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.52% of the current distribution faces >90 percent degradation severity, 4.39% of the distribution faces >70 percent degradation severity, and 40.23% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

ZAMBEZI ALLUVIAL VEGETATION

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Vegetação aluvial do Zambeze

Biome Savannas and grasslands (T4)

Functional group Trophic savannas (T4.1)

Regional Ecosystem Tropical Alluvial Savanna

Description

Alluvial floodplain with seepage areas, riparian woodlands, and flooded (hygrophilous) grasslands along large drainage lines.

Distribution

Floodplain of the Zambezi River and its large tributaries, from just above the Zambezi Delta to the Lupata Gorge. It also occurs further west but in smaller unmapped areas. Occurring in Manica, Sofala, Tete, and Zambezia Provinces.

Characteristic native biota

The riparian vegetation of the Zambezi River banks is dominated by the fringing forest of *Acacia polyacantha* subsp. *campylacantha, A. robusta* subsp. *usambarensis, Albizia versicolor, A. harveyi, Combretum imberbe, Cordyla africana, Diospyros mespiliformis, Faidherbia albida, Ficus sycomorus* subsp. *sycomorus, Garcinia livingstonei, Kigelia pinnata, Manilkara mochisia, Phoenix reclinata, Spirostachys africana, Trichilia emetica,* and *Xanthocercis zambesiaca.* Small trees and shrubs represented are *Cladostemon kirkii, Combretum microphyllum, Maclura africana, Searsia gueinzii, Strophanthus* spp., *Phyllanthus reticulatus, Tiliacora funifera,* etc.

Away from the riparian belt the alluvial plain is characterized by the palms *Hyphaene petersiana* (grading towards the coast to *H. coriacea*) and scattered *Borassus aethiopum,* with trees such as *Acacia* spp. (*nigrescens, xanthophloea, polyacantha* subsp. *campylacantha, nilotica* subsp. *kraussiana, sieberiana* var. *woodii*), *Adansonia digitata, Berchemia discolor*, *Combretum mossambicense, Dalbergia boehmii*, *Ficus bussei, Philenoptera violacea, Sterculia appendiculata,* and *Tamarindus indica,* with sometimes almost pure stands of *Colophospermum mopane*.

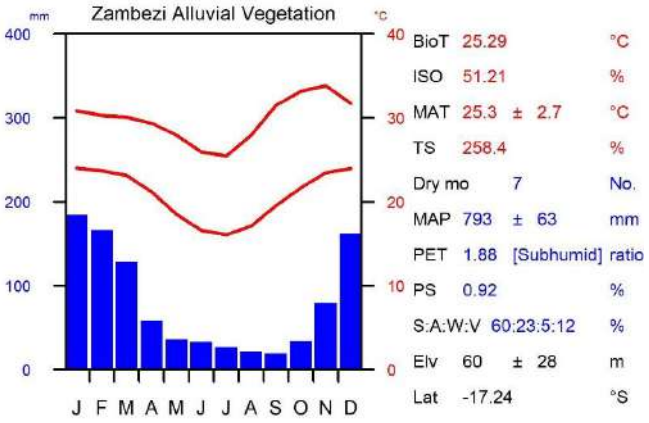
Shrubby elements include *Combretum mossambicense, Cordia sinensis, Decorsea schlechteri, Dichrostachys cinerea* subsp. *africana* var. *plurijuga, Hermannia kirkii, Tephrosia uniflora,* etc. Grasses are dominated by *Heteropogon contortus*, with *Urochloa trichopus, Panicum sp*p., etc.

In sandy areas and on rocky ridges may occur *Pterocarpus lucens* subsp. *antunesii, Pteleopsis myrtifolia, Guibourtia conjugata, Bauhinia petersiana, Cola mossambicensis* and *Pavetta klotzschiana.*

Abiotic environment and climate

Altitude range of 20 to 140 m asl with a mean of 60 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 49.8% while the similarly measured clay content is 30.8%. Soil pH is 6.3.

Precipitation during driest quarter is 26.1 mm.



Species of Conservation Importance: none recorded.

Photographic credits Zambezi River near Shupanga. photo: M. Stalmans.

RLE Assessment

Assessment Summary

This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 27.21% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 57 10 x 10 km grid cells and an EOO of 9443.81 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.91% of the current distribution faces >90 percent degradation severity, 7.4% of the distribution faces >70 percent degradation severity, and 51.85% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

ZAMBEZI DELTA FLOODPLAIN GRASSLAND

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Pradaria de inundação do Delta do Zambeze
Biome Savannas and grasslands (T4)
Functional group Trophic savannas (T4.1)
Regional Ecosystem Tropical Alluvial Savanna

Description

A mosaic of palm savanna, shrubby or low acacia savanna (or very open woodland), some patches of swamp forest and extensive freshwater swamps. Halophytic vegetation is confined to adjacent mangroves and creeks.

Distribution

The Zambezi Delta, central Mozambique. Occurring in Sofala and Zambezia Provinces.

Characteristic native biota

This unit consists of a mosaic of five plant communities. Species composition is generally related to soil moisture, and frequency, duration and depth of flooding.

1) ***Acacia* savanna with *Hyphaene* on more elevated delta plain**. *Acacia polyacantha* is dominant but also with *A. sieberiana, A. xanthophloea, Antidesma venosum, Philenoptera violacea, Combretum imberbe, Trichilia emetica, Diospyros mespiliformis, Ficus bussei, F. sycomorus* subsp. *sycomorus, Garcinia livingstonei, Hyphaene coriacea, Kigelia africana, Morus mesozygia, Sterculia appendiculata, Xanthocercis zambesiaca*, with shrubby species such as *Brexia madagascariensis, Combretum mossambicense, Dichrostachys cinerea* subsp. *forbesii, Grewia* spp., *Maerua triphylla* var. *pubescens* and *Searsia quartiniana.* Low shrubs include *Aeschynomene crista* subsp. *cristata, Crotalaria mocubensis, C. polysperma, C. virgulata* subsp. *forbesii, Eriosema psoraleoides, Hoslundia opposita, Indigofera dendroides, I. latifolia, Mimosa pigra, Ruspolia decurrens, Sesbania tetraptera, Tephrosia purpurea* subsp. *dunensis* and *Vernonia kirkii.*

Dense mixed stands of *Borassus aethiopum* occur in slightly wetter areas. Grass growth is vigorous, with dense cover of tussock species including *Hyparrhenia dichroa, Ischaemum afrum* and *Chrysopogon nigritanus.*

2) ***Borassus* and *Hyphaene* palm savanna**. Open woodland to wooded grassland characterised by trees of *Borassus aethiopum* to 20 m and *Hyphaene coriacea* 4 to 8 m high. Closer to drainage lines the palms become closer and *Hyphaene* can form a low woodland. *Acacia polyacantha, A. sieberiana*, and *A. xanthophloea* are found closer to drainage lines. Occasional riverine trees on the banks of seasonal channels. *Hyparrhenia dichroa, Imperata cylindrica,* and *Ischaemum afrum* are dominant bunch grasses below the *B. aethiopum* canopy, with *Setaria* spp. and stoloniferous grasses dominant in depressed wetter sites on humid gley soils.

3) **Tussock grassland**. Seasonally wet vegetation dominated by tussock and mat-forming grasses up to 2 m high. Main species are *Panicum* sp., *Sporobolus pyramidalis, Brachiaria humidicola* and *Leersia hexandra.* Trees and other woody plants are virtually absent; woody species such as *Phoenix reclinata, Ziziphus mucronata* and *Lannea schweinfurthii* may occur on slightly elevated ground and termitaria.

4) **Stoloniferous swamp grassland occurs in the lowland floodplain with prolonged inundation and perennially wet soils**. Species include *Echinochloa pyramidalis, Cyperus digitatus, C. exaltatus, C. distans, Leersia hexandra, Oryza longistamineus, Hemarthria altissima, Panicum maximum, P. repens*, and *Setaria* spp. *C. exaltatus* is often dominant in semi-permanent deep water areas, especially old anastomosing channels, over vast areas of the southern delta. In

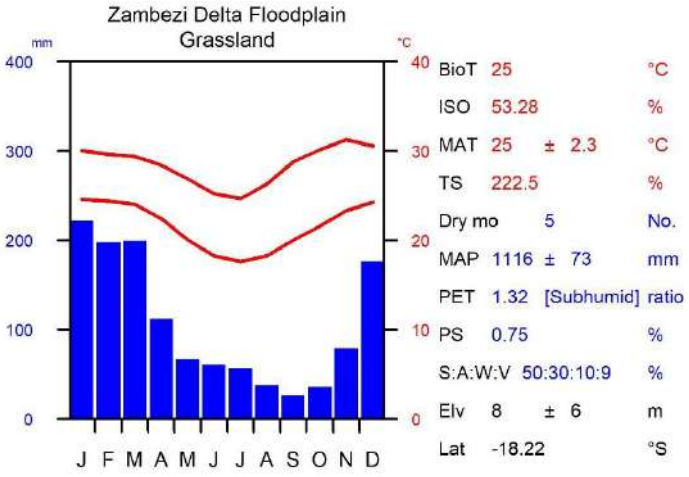
deepest water conditions, *C. exaltatus* gives way to papyrus swamps. Other herbs include *Hibiscus diversifolius, Ludwigia* spp. and *Mimosa pigra*. Woody plants are almost entirely absent.

5) **Delta channels near the sea**. These are lined with a freshwater swamp of *Barringtonia racemosa*, *Ficus trichopoda, Hibiscus tiliaceus, Thespesia populnea, Pandanus livingstonianus* and numerous climbers or lianes such as *Entada rheedii, Mucuna gigantea, Ipomoea cairica, Keetia venosa,* etc. The steeper banks are fringed with *Acacia xanthophloea, A. robusta* var. *clavigera, Phoenix reclinata, Terminalia catappa* and *Trichilia emetica.*

Abiotic environment and climate

Altitude range of 3 to 28 m asl with a mean of 8 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 47.2% while the similarly measured clay content is 34.3%. Soil pH is 6.4.

Precipitation during driest quarter is 56.2 mm.



Species of Conservation Importance

Endemic Plant Species

Siphonochilus kilimanensis [E].

Threatened Plant Species

Siphonochilus kilimanensis [VU].

Photographic credits *All photos*: Zambezi delta area. photos: M. Stalmans.

RLE Assessment

Assessment Summary

This ecosystem has a restricted geographic distribution but there is little evidence of ongoing declines in extent. However, moderate degradation levels are present across most of the distribution of the ecosystem. **Vulnerable**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 23.02% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 171 10 x 10 km grid cells and an EOO of 23704.18 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 3.42% of the current distribution faces >90 percent degradation severity, 9.59% of the distribution faces >70 percent degradation severity, and 82.01% of the distribution faces >50 percent degradation severity. Vulnerable

Criterion E: Not evaluated

3.1.1.3 Biome: T4 Savannas and grasslands

T4.2 Pyric tussock savannas

CHERINGOMA COASTAL PALM SAVANNA

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Pradaria arbórea de palmar de Cheringoma
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Eastern Coastal Woodland

Description

Open semi-deciduous woodland, or more commonly a wooded grassland on coastal sandy soils, often seasonally wet.

Distribution

Confined to the coastal area between the Zambezi Delta and Beira, Sofala Province.

Characteristic native biota

Because of its remoteness, this is a relatively poorly explored area, and therefore plant data are few.

An area of coastal flats, floodplains and wetlands, typically of coastal grassland dotted with the palms *Hyphaene coriacea* and, to a lesser extent, *Phoenix reclinata, Annona senegalensis, Piliostigma thonningii, Strychnos spinosa, Syzygium* sp. A of Burrows *et al*. 2018, *Uapaca nitida* and *Vitex doniana*. Open sandy areas are characteristically favoured by the shrubby trees *Morella spathulata* and *Erica simii*, the latter forming a coastal macchia or heath in places.

The grasslands form a mosaic with patches of coastal forest dominated by *Afzelia quanzensis, Hirtella zanzibarica, Hymenaea verrucosa* and *Parkia filicoidea* along streams. Other tree and shrub species recorded from the forest patches include *Diospyros natalensis, Glyphaea tomentosa, Grewia transzambesica, Monanthotaxis trichocarpa, Ochna angustata, O. mossambicensis, Psydrax micans, Solanum richardii, S. zanzibarense,* with *Acacia gerrardii var. gerrardii* in more open situations.

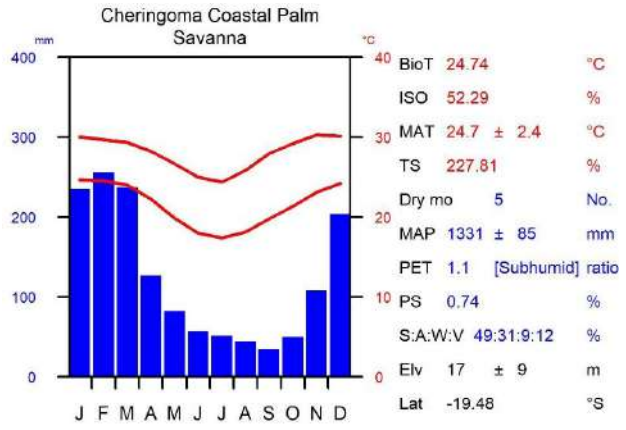
The grasses recorded from this type include *Andropogon chinensis, Digitaria milanjiana, Eragrostis chapelieri, Heteropogon contortus, Hyperthelia dissoluta, Pogonarthria*

squarrosa, Cynodon dactylon, Panicum maximum, P. subflabellatum, Oryza longistaminata and *Setaria megaphylla* – the last-named probably associated with dry forest patches.

Abiotic environment and climate

Altitude range of 4 to 45 m asl with a mean of 17 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 53.7% while the similarly measured clay content is 28.6%. Soil pH is 6.3.

Precipitation during driest quarter is 77 mm.



Species of Conservation Importance: none recorded.

Endemic Plant Species

Psydrax micans [NE].

Threatened Plant Species

Psydrax micans [VU].

Photographic credits *Top*: savanna with *Hyphaene coriacea* and *Phoenix reclinata*, Chinizuia coastal plains, Sofala Province. photo: M. Lotter; *bottom*: seasonally wet coastal grasslands, Savanne, Beira. photo: J. Burrows.

RLE Assessment

Assessment Summary	Assessment Information
This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**	**Criterion A:** Expansion of urban areas, agriculture & deforestation has caused an 8.8% decline since 1750. Least Concern **Criterion B:** This ecosystem has an AOO of 39 10 x 10 km grid cells and an EOO of 3011.46 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern **Criterion C:** Not evaluated **Criterion D:** Degradation assessment shows that 0.84% of the current distribution faces >90 percent degradation severity, 3.49% of the distribution faces >70 percent degradation severity, and 16.34% of the distribution faces >50 percent degradation severity. Least Concern **Criterion E:** Not evaluated

INHARRIME COASTAL PALM SAVANNA

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Pradaria arbórea de palmar de Inharrime
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Eastern Coastal Woodland

Description

On poorly drained lowland, coastal areas, with an abundance of lakes or depressions and with palms passing into savanna woodlands with Brachystegia spiciformis on higher grounds (Inhambane Coastal Miombo). The poorly drained area is as a result from water seeping from the undulating Quaternary dunes onto calcareous plains, being exposed at the dune base. Differs from the adjacent poorly drained Banhine Inland Salt Pans that occurs on clay soils (not sandy soils) and in drier climates.

Distribution

Limited to the poorly drained areas between Xai Xai (Gaza Province) and Mucoduene (Inhambane Province) in southern Mozambique.

Characteristic native biota

An open wooded grassland characterized by the palms *Phoenix reclinata, Hyphaene coriacea*, and *Borassus aethiopum*, as well as frequent tree species such as *Acacia polyacantha* subsp. *campylacantha, Garcinia livingstonei, Mimusops caffra*, and *Syzygium cordatum.* Additional trees are *Afzelia quanzensis, Acacia gerrardii, Albizia versicolor, Baphia kirkii* subsp. *ovata, Clerodendrum glabrum, Commiphora schlechteri, Diospyros rotundifolia, Ficus exasperata, Sclerocroton integerrimus, Strychnos madagascariensis*, and *S. spinosa.*

Small trees and woody shrubs include *Acacia kraussiana, Artabotrys brachypetalus, Brexia madagascariensis* (near the coast), *Chamaecrista paralias, Croton pseudopulchellus, Diospyros villosa* var. *villosa, Ehretia rigida, Grewia caffra, G. occidentalis* var. *litoralis, Lagynias monteiroi, Olax dissitiflora, Parinari capensis* subsp. *incohata, Pleiocarpa pycnantha, Psydrax locuples, P. moggii, Suaeda monoica, Tricalysia delagoensis, Turraea nilotica,* and *Uvaria lucida* subsp. *virens.*

Soft shrubs and herbaceous species include *Ammannia radicans* var. *floribunda, Barleria delagoensis, Blumea axillaris, Chamaecrista mimosoides, C. plumosa* var. *plumosa, Cleome angustifolia* subsp. *petersiana, C. macrophylla, Crotalaria monteiroi, C. pallida, Helichrysopsis septentrionalis, Helichrysum kraussii, Hilliardiella aristata, Indigofera hirsuta, I. laxiracemosa, I. podophylla, Linzia glabra, Sesbania bispinosa* var. *bispinosa, S. goetzei, S. sesban, Tephrosia forbesii, T. purpurea* subsp. *canescens, Thesium breyeri*, and *Vernoniastrum ambiguum.*

Graminoids include *Chloris virgata, Digitaria eriantha, D. macroglossa, Elionurus muticus, Eragrostis ciliaris, E. scleranthа, E. superba, Hyperthelia dissoluta, Sporobolus virginicus* and *Tricholaena monachne.*

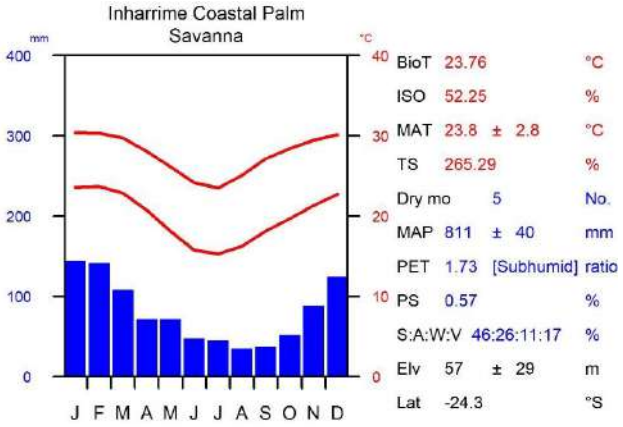
In and on the margins of pools and swamps occur *Antherotoma debilis, Cyclosorus interruptus, Cyperus articulatus, Ficus verruculosa, Hydrocotyle bonariensis, Juncus kraussii, Limnophyton* spp., *Najas marina, Nymphaea capensis, Phragmites australis,* and *Schoenoplectus scirpoides.*

On drier ground the following tree species come in: *Albizia adianthifolia, Brachystegia spiciformis, Julbernardia globiflora* and *Pterocarpus angolensis*, species that are more typical of the surrounding Inhambane Coastal Miombo.

Abiotic environment and climate

Altitude range of 10 to 155 m asl with a mean of 57 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 69.6% while the similarly measured clay content is 18.2%. Soil pH is 6.1.

Precipitation during driest quarter is 76.3 mm.



Species of Conservation Importance

Endemic Plant Species

Chrysocoma mozambicensis [NE], *Elaeodendron fruticosum* [E].

Biogeographic Anomalies

Baphia kirkii subsp. *ovata, Chamaecrista paralias, Helichrysopsis septentrionalis.*

RLE Assessment

Assessment Summary

This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 25.54% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 155 10 x 10 km grid cells and an EOO of 20600.62 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.02% of the current distribution faces >90 percent degradation severity, 1.47% of the distribution faces >70 percent degradation severity, and 29.26% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

MAPUTALAND COASTAL WOODED GRASSLAND

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Pradaria arbórea costeira de Maputaland
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Eastern Coastal Woodland

Description

Open semi-deciduous woodland, or more commonly a wooded grassland on coastal sandy soils.

Distribution

From South Africa in the south, extending northwards along the coast as far as Bilene. Occurring in Gaza and Maputo Provinces.

Characteristic native biota

An open grassy landscape dominated mainly by the palm *Hyphaene coriacea* and the trees *Garcinia livingstonei, Strychnos madagascariensis, Strychnos spinosa*, and *Syzygium cordatum*. Other frequent species are *Acacia natalitia, Annona senegalensis, Antidesma venosum, Bridelia carthartica* subsp. *cathartica, Phoenix reclinata, Psydrax moggii, Sclerocarya birrea* subsp. *caffra, Sclerocroton integerrimum, Trichilia emetica, Vangueria infausta, and Xylotheca kraussiana* var. *glabrifolia*. Trees and woody shrubs occasionally present are *Acacia gerrardii, Afzelia quanzensis, Albizia adianthifolia, Catunaregam obovata, Coddia rudis, Commiphora schlechteri, Dialium schlechteri, Empogona coriacea, Ficus burtt-davyi, Gymnosporia arenicola, Kraussia floribunda, Lagynias monteiroi, Psorospermum febrifugum, Psydrax locuples, Searsia natalensis, Terminalia sericea, Tricalysia delagoensis,* and *Turraea nilotica.*

The shrub *Helichrysum kraussii* and scrambler *Smilax anceps* are often dominant but other shrubs and herbaceous species include *Agathisanthemum bojeri, Alysicarpus vaginalis, Chamaecrista plumosa, Chrysocoma ciliata, Clerodendrum ternatum, Crotalaria monteiroi, Desmodium dregeanum, Dicerocaryum senecioides, Disa woodii, Eriosema parviflorum, Gazania krebsiana* subsp. *serrulata, Gladiolus crassifolius, Gloriosa superba, Helichrysum adenocarpum* subsp. *ammophilum, H. candolleanum, H. longifolium, H. silvaticum, Indigofera inhambanensis, Merremia tridentata subsp. angustifolia, Pentarrhinum insipidum, Phyllanthus delagoensis, Polygala capillaris, Trachyandra saltii, Tritonia moggii,* and *Vernonia centaureoides.* The fern *Pteridium aquilinum* subsp. *capense* may form extensive colonies in moister areas.

These coastal grasslands are characterized by an abundance of *geoxylic suffrutices* or *geoxyles* (underground trees), represented by *Albertisia delagoensis, Eugenia capensis* subsp. *multiflora, E. mossambicensis, Diospyros villosa* (geoxyle form), *Gymnosporia markwardii, Ochna natalitia* (geoxyle form), *Parinari capensis* subsp. *incohata, Salacia rehmannii* and, particularly common or abundant, *Salacia kraussii.*

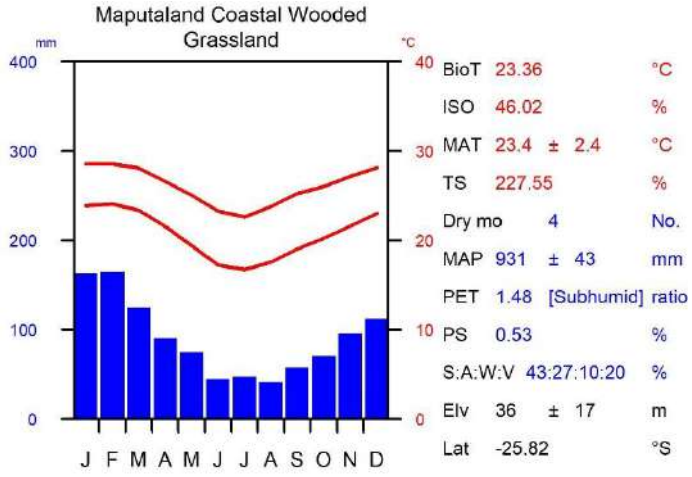
Some of the grasses and sedges recorded are *Andropogon eucomus* subsp. *huillensis, Bewsia biflora, Brachiaria chusqueoides, Brachychloa schiemanniana, Cymbopogon caesius, Cynodon dactylon, Digitaria argyrotricha, D. milanjiana, Diheteropogon amplectens, Elionurus argenteus, Eragrostis ciliaris, E. inamoena, Fimbristylis cymosa, Hyparrhenia dissoluta, Ischaemum arcuatum, I. fasciculatum, Melinis nerviglumis, Mnesithea laevis, Panicum*

pleianthum, Perotis patens, Pogonarthria squarrosa, Rhynchospora brownii, Trachypogon spicatus, and *Urelytrum squarrosum.*

Abiotic environment and climate

Altitude range of 5 to 80 m asl with a mean of 36 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 77.6% while the similarly measured clay content is 13.9%. Soil pH is 5.9

Precipitation during driest quarter is 95.8 mm.



Species of Conservation Importance

Endemics

Adenopodia schlechteri [E], *Millettia ebenifera* [NE], *Raphia australis* [NE], *Solanum litoraneum* [E], *Stangeria eriopus* [NE*], *Tephrosia forbesii* subsp. *forbesii* [NE], *Tephrosia forbesii* subsp. *inhacensis* [NE].

Threatened Plant Species

Adenopodia schlechteri [VU], *Solanum litoraneum* [EN], *Stangeria eriopus* [VU*].

Biogeographic Anomalies

Helichrysum adenocarpum subsp. *ammophilum, Vahlia capensis* subsp. *vulgaris* var. *longifolia, Asclepias gordon-grayae, Kniphofia leucocephala, Raphionacme lucens, Restio zuluensis.*

Photographic credits *Left*: geoxyle-dominated coastal grassland, Bilene, Gaza Province. photo: J. Burrows; *right*: Maputo Special Reserve, Maputo Province. photo: M. Stalmans.

RLE Assessment

Assessment Summary

This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 25.73% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 54 10 x 10 km grid cells and an EOO of 9282.13 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.91% of the current distribution faces >90 percent degradation severity, 5.72% of the distribution faces >70 percent degradation severity, and 41.47% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

NAMPULA COASTAL PALM SAVANNA

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Pradaria arbórea costeira de palmar de Nampula
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Eastern Coastal Woodland

Description

A large area characterized by open wooded coastal grassland with palms (*Hyphaene coriacea* and *Phoenix reclinata*) and scattered trees, with patches of closed woodland and dry semi-deciduous forest.

Distribution

Limited to Nampula Province, from Nacala, southwards along the coast to Moma.

Characteristic native biota

Although *Brachystegia* and *Julbernardia* may be present, it is rarely that an area of true miombo woodland is encountered. The dominant tree species are *Adansonia digitata, Afzelia quanzensis, Acacia polyacantha* subsp. *campylacantha, A. nigrescens, A. robusta* subsp. *usambarensis, Albizia versicolor, A. glaberrima* var. *glabrescens* (riverine), *Brachystegia spiciformis, B. boehmii, Cordyla africana, Julbernardia globiflora, Millettia stuhlmannii, Pterocarpus angolensis, Trichilia emetica, T. capitata* and *Xeroderris stuhlmannii*. Less common trees include *Albizia amara, A. brevifolia, A. forbesii, A. harveyi, Ficus sansibarica* subsp. *sansibarica, F. sycomorus, Philenoptera bussei* and *Swartzia madagascariensis.*

Smaller trees include *Acacia* spp. (*adenocalyx, amythethophylla, ataxacantha, gerrardii, latistipulata, nilotica* subsp. *kraussiana*), *Cladostemon kirkii, Combretum hereroense, Commiphora glandulosa, C. serrata, Euphorbia lividiflora, Maerua angolensis, Mundulea sericea, Olax dissitiflora, Senna petersiana, S. singueana, Tetracera boiviniana*, and *Xylotheca tettensis* var. *macrophylla.*

Shrubby species are numerous and include *Annona senegalensis, Buchnerodendron lasiocalyx, Capparis tomentosa, Catunaregam stenocarpa, Dichrostachys cinerea* subsp. *nyassana, Erythroxylum platyclados Grewia transzambesica, Dielsiothamnus divaricatus, Diospyros loureiriana, D. verrucosa, Maerua triphylla* var. *pubescens, Monodora grandidieri, M. junodii* subsp. *junodii, Ochna angustata, Psydrax moggii* and *Synaptolepis alternifolia*. Nearer the littoral zone one finds *Guilandina bonduc, Pseudovigna argentea, Blepharis dunensis* and *Barleria setosa.*

Patches of dry forest patches contain, among others, canopy species such as *Diospyros natalensis, Hilsenbergia nemoralis, Hirtella zanzibarica, Hymenaea verrucosa, Icuria dunensis, Micklethwaitia carvalhoi, Millettia usaramensis* subsp. *australis, Pseudobersama mossambicensis, Pteleopsis barbosae, P. myrtifolia, Scorodophloeus torrei, Sideroxylon inerme* subsp. *diospyroides* and *Terminalia sambesiaca*. Associated shrubs and lianes of these dry forest patches include *Carvalhoa campanulata, Combretum pisoniiflorum, C. illairii, Coffea zanguebariae, Grewia vaughanii, Hexalobus mossambicensis, Leptactina delagoensis* subsp. *delagoensis, Memecylon torrei, Monanthotaxis trichocarpa, Mostuea microphylla, Oxyanthus zanguebaricus, Pavetta mocambicensis, Psydrax micans, Tarenna pembensis, Pyrostria bibracteata, Rotheca microphylla, Sclerochiton coeruleus* and *Warneckea sessilicarpa.*

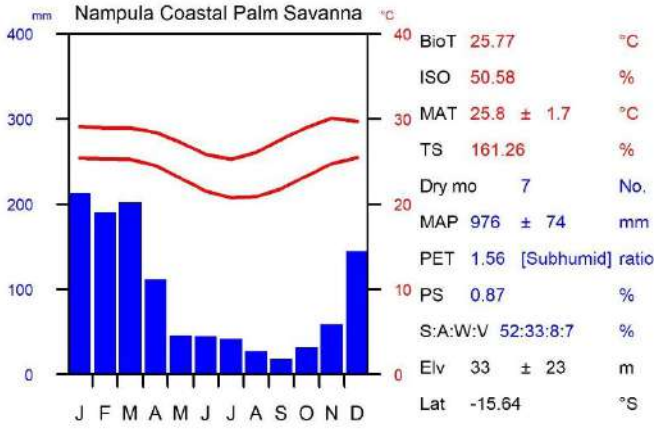
Lianes and climbers include *Ancylobotrys petersiana, Artabotrys brachypetalus, Dalbergia bracteolata, D. fischeri, Entada rheedii, E. stuhlmannii* and *Strophanthus courmontii.*

Grasses are diverse, with a few recorded species being *Andropogon appendiculatus, Bothriochloa bladhii, Cenchrus polystachyos, Dichanthium annulatum, Digitaria eriantha, Hackelochloa granularis, Heteropogon contortus, Loudetia arundinacea, L. simplex, Mnesithea laevis, Oryza longistaminata, Paspalum scrobiculatum, Pennisetum unisetum, Perotis patens* and *Tricholaena monachne.*

Abiotic environment and climate

Altitude range of 5 to 100 m asl with a mean of 33 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 59.8% while the similarly measured clay content is 24.8%. Soil pH is 6.3.

Precipitation during driest quarter is 31.8 mm.



Species of Conservation Importance

Endemic Plant Species

Acacia latistipulata [NE], *Aloe mossurilensis* [E*], *Barleria setosa* [E], *Blepharis dunensis* [E], *Combretum caudatisepalum* [E], *Grewia filipes* [E], *Hexalobus mossambicensis* [E], *Macrotyloma decipiens* [E], *Micklethwaitia carvalhoi* [E], *Momordica henriquesii* [NE], *Scorodophloeus torrei* [E], *Siphonochilus kilimanensis* [E], *Tephrosia faulknerae* [E], *Terminalia barbosae* [EN], *Vitex carvalhi* [NE], *Vitex mossambicensis* [NE], *Warneckea sessilicarpa* [E].

Threatened Plant Species

Acacia latistipulata [VU], *Aloe mossurilensis* [CR*], *Barleria setosa* [EN], *Blepharis dunensis* [EN], *Coffea zanguebariae* [VU], *Combretum caudatisepalum* [VU], *Grewia filipes* [EN], *Hexalobus mossambicensis* [VU], *Hildegardia migeodii* [EN], *Micklethwaitia carvalhoi* [EN], *Momordica henriquesii* [EN], *Scorodophloeus torrei* [EN], *Siphonochilus kilimanensis* [EN], *Terminalia barbosae* [E], *Vitex carvalhi* [VU], *Vitex mossambicensis* [VU], *Warneckea sessilicarpa* [CR].

RLE Assessment

Assessment Summary

This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 43.01% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 103 10 x 10 km grid cells and an EOO of 17174.27 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 2.8% of the current distribution faces >90 percent degradation severity, 12.5% of the distribution faces >70 percent degradation severity, and 54.06% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

ROVUMA COASTAL WOODED GRASSLAND

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Pradaria arbórea costeira do Rovuma
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Eastern Coastal Woodland

Description

Semi-deciduous open woodland that is confined to the coastal plain on coarse, white sands, often in seasonally wet areas.

Distribution

Along the coast between Quionga and Quissanga in north-eastern Mozambique. Occurring in Cabo Delgado Province.

Characteristic native biota

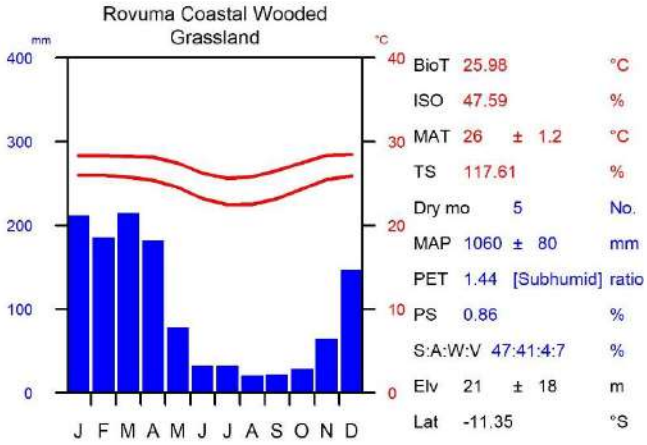
The canopy is 5 – 8 m tall, sparse to moderately closed and is almost always dominated by *Parinari curatellifolia*. Other trees include *Sclerocarya birrea* subsp. *caffra, Pseudolachnostylis maprouneifolia, Dalbergia nitidula, Maprounea africana, Phyllocosmus lemaireanus* and *Hirtella zanzibarica*. The shrub and small tree stratum is dominated by *Strychnos madagascariensis*, as well as *Strychnos spinosa* and *Garcinia livingstonei* in some areas.

Many open sandy areas are dominated by the palms *Hyphaene compressa* and *H. coriacea*. Other diagnostic tree or shrub species include *Brackenridgea zanguebarica, Ochna kirkii, Tetracera boiviniana, Xylotheca tettensis* and *Uvaria kirkii*. Other shrubs and trees that occur in other vegetation types but are nonetheless common in Rovuma Coastal Wooded Grassland include *Erythroxylum platycladum, Olax dissitiflora* and *Gardenia ternifolia*. The diversity of forbs and geophytes is relatively low and includes *Crinum stuhlmannii, Gladiolus decoratus, Striga pubiflora, Pentodon pentandrus, Agathisanthemum bojeri* and *Antherotoma debilis*. Prominent grasses and sedges are *Hyperthelia dissoluta, Hyparrhenia* spp., *Digitaria* spp., *Ctenium concinnum, Andropogon* spp., *Heteropogon contortus, Themeda triandra, Cyperus amabilis, C. niveus* and *Bulbostylis oritrephes.*

Abiotic environment and climate

Altitude range of 5 to 39 m asl with a mean of 15 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 63.7% while the similarly measured clay content is 21.5%. Soil pH is 6.1.

Precipitation during driest quarter is 34.9 mm.



Species of Conservation Importance

Endemic Plant Species

Ammannia pedroi [E], *Barleria rhynchocarpa* [NE], *Duosperma dichotomum* [E], *Memecylon torrei* [E], *Oxyanthus strigosus* [E], *Pavetta lindina* [NE], *Premna hans-joachimii* [NE], *Vangueria domatiosa* [E], *Xylopia lukei* [NE), *Zanthoxylum lindense* [NE].

Threatened Plant Species

Ammannia pedroi [VU], *Barleria rhynchocarpa* [VU], *Diospyros shimbaensis* [VU], *Duosperma dichotomum* [VU], *Memecylon torrei* [EN], *Oxyanthus strigosus* [EN], *Pavetta lindina* [EN], *Premna hans-joachimii* [VU], *Vangueria domatiosa* [EN], *Xylopia lukei* [EN], *Zanthoxylum lindense* [VU].

Photographic credits *Left*: wooded grassland characterized by *Hyphaene compressa* and *H. coriacea*, Quiterajo, Cabo Delgado. photo: J. Burrows; *right*: wooded grassland north of Palma, Cabo Delgado. photo: W. McCleland.

RLE Assessment

Assessment Summary

This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 31.34% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 40 10 x 10 km grid cells and an EOO of 5011.45 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 1.83% of the current distribution faces >90 percent degradation severity, 9.06% of the distribution faces >70 percent degradation severity, and 49.15% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

SAVE COASTAL PALM SAVANNA

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Pradaria arbórea costeira de palmar do Save
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Eastern Coastal Woodland

Description

Open deciduous woodland on poorly drained soils or sublittoral areas with an abundance of palms passing into savanna woodlands or savanna.

Distribution

Extending along the coast, from Macovane northwards to the town of Sofala. Occurring in Inhambane and Sofala Provinces.

Characteristic native biota

The eponymous palms in this vegetation type are *Borassus aethiopum, Hyphaene coriacea* and *Phoenix reclinata*, with dominant trees and shrubs being *Parinari curatellifolia, Strychnos madagascariensis, S. spinosa,* and *Garcinia livingstonei*. Some other trees and shrubs recorded are *Acacia polyacantha* subsp. *campylacantha, A. robusta* subsp. *usambarensis, Capparis erythrocarpos* var. *rosea, Crossopteryx febrifuga, Dichrostachys cinerea, Diospyros loureiriana, Euphorbia bougheyi, E. lividiflora, Ficus sycomorus* subsp. *sycomorus, Grewia transzambesica, Maprounea africana, Ozoroa obovata, Piliostigma thonningii, Pseudolachnostylis maprouneifolia, Sclerocarya birrea* subsp. *caffra, Sideroxylon inerme,* and *Xylotheca kraussiana.*

Soft shrubs and herbaceous species recorded are *Cycnium tubulosum* subsp. *tubulosum, Cynanchum mossambicense, Dicerocaryum senecioides, Eriosema psoraleoides, Eulophia speciosa, Heliotropium ovalifolium, Hygrophila auriculata, Hydrocotyle verticillata, Justicia flava, Lobelia erinus, Mimosa pigra, Nidorella resedifolia, Phyla nodiflora, Polygala senensis, Trichodesma zeylanicum*, and *Vahlia capensis*.

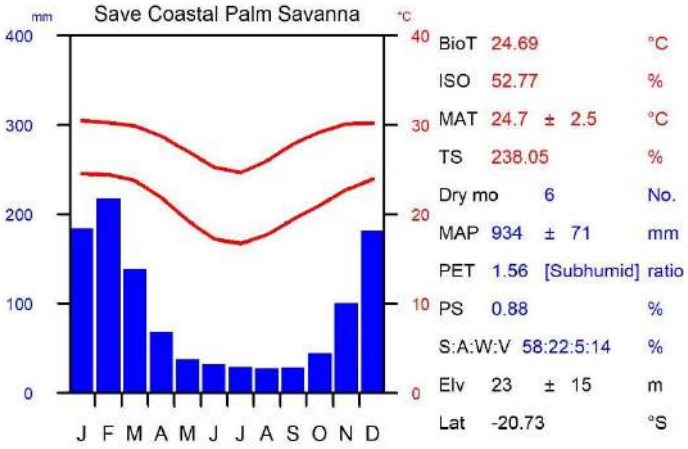
Some grasses and sedges include: *Andropogon appendiculatus, Bothriochloa bladhii, Chrysopogon nigritanus, Craspedorhachis africana, Cynodon dactylon, Dactyloctenium aegyptium, Digitaria*

diagonalis, D. rukwae, *Echinochloa stagnina, Eragrostis chapelieri, Hyperthelia dissoluta, Imperata cylindrica, Melinis repens,* and *Pogonarthria squarrosa.*

Abiotic environment and climate

Altitude range of 4 to 70 m asl with a mean of 23 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 58.4% while the similarly measured clay content is 25.7%. Soil pH is 6.4.

Precipitation during driest quarter is 45.3 mm.



Species of Conservation Importance

Endemic Plant Species

Encephalartos ferox subsp. *emersus* [E].

Threatened Plant Species

Encephalartos ferox subsp. *emersus* [NT].

Photographic credits *Top*: 21 km E of Save, lower Save River, Inhambane Province. photo: W. McCleland; *bottom*: 24 km SSW of Nova Mambone, Inhambane Province. photo: W. McCleland.

RLE Assessment

Assessment Summary

This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 4.19% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 64 10 x 10 km grid cells and an EOO of 6937.68 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0% of the current distribution faces >90 percent degradation severity, 0.63% of the distribution faces >70 percent degradation severity, and 13.86% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

GAZA SANDY GUIBOURTIA WOODLAND

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Mata arenosa de Chacate de Gaza
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Lowveld Savanna

Description

Mixed and fairly open to closed deciduous woodland on sands.

Distribution

Mostly in Gaza Province, southwards from Save River along the Zimbabwe border, to the northern banks of the Limpopo River as far south as Mabalane. Also in Zimbabwe.

Characteristic native biota

Largely dominated by *Guibourtia conjugata, Combretum apiculatum, Combretum collinum, Combretum zeyheri, Millettia stuhlmannii, Philenoptera bussei, Pteleopsis myrtifolia, Strychnos madagascariensis*, and *Terminalia sericea.* Other woody species include *Acacia nigrescens Afzelia quanzensis, Balanites maughamii, Berchemia discolor, Brachystegia spiciformis* (although rare), *Burkea africana, Cassia abbreviata, Chazaliella abrupta* var. *parvifolia, Dalbergia melanoxylon, Dalbergia nitidula, Diplorhynchus condylocarpon, Gardenia resiniflua, Kirkia acuminata, Lannea discolor, L. schweinfurthii* var. *stuhlmannii, Manilkara mochisia, Philenoptera bussei, Pseudolachnostylis maprouneifolia, Pterocarpus angolensis, Sclerocarya birrea* subsp. *caffra*, and *Xeroderris stuhlmannii.*

Colophospermum mopane is also present in small patches on localised clay soils, in depressions and along drainage lines together with *Spirostachys africana.*

Shrubs include *Alchornea laxiflora, Cissus cornifolia, Commiphora africana, Dalbergia nitidula, Erythrococca menyharthii, Ozoroa paniculosa* var. *paniculosa*, and *Senna petersiana.*

Herbaceous plants noted are *Centemopsis kirkii*, *Dicerocaryum senecioides*, *Hemizygia bracteosa*, *Heliotropium indicum*, *Hibiscus calyphyllus*, *Triumfetta pentandra, Waltheria indica*, and *Zornia glochidiata*.

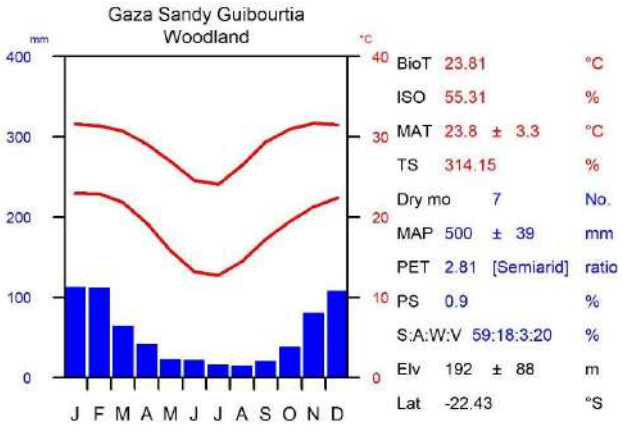
Grasses recorded are *Aristida congesta, A. meridionalis, A. mollissima, A. rhiniochloa, A. stipitata, Bothriochloa insculpta, Cenchrus ciliaris, Digitaria eriantha, Digitaria milanjiana, D. pentzii, Eragrostis jeffreysii, E. lehmanniana, E. pallens, Heteropogon contortus, Pogonarthria squarrosa, Panicum maximum, Perotis patens, Schmidtia*

pappophoroides and *Urochloa mosambicensis.*

Abiotic environment and climate

Altitude range of 60 to 400 m asl with a mean of 192 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 64.2% while the similarly measured clay content is 22.8%. Soil pH is 6.6.

Precipitation during driest quarter is 14.3 mm.



Species of Conservation Importance

Endemic Plant Species

Indigofera torrei [E].

Photographic credits *left*: Zinave National Park, Inhambane Province. photo: M. Stalmans; *right*: Banhine National Park, Gaza Province. photo: M. Stalmans.

RLE Assessment

Assessment Summary

This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 7.26% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 337 10 x 10 km grid cells and an EOO of 43660.12 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.12% of the current distribution faces >90 percent degradation severity, 0.71% of the distribution faces >70 percent degradation severity, and 10.55% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

NWAMBIYA-PUMBE SANDY BUSHVELD

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Pradaria arbustiva arenosa de Nwambyla-Pumbe

Biome Savannas and grasslands (T4)

Functional group Pyric tussock savannas (T4.2)

Regional Ecosystem Lowveld Savanna

Description

Deciduous open woodland on deep sands.

Distribution

From Nwambiya and Pumbe in Kruger NP, South Africa, southwards on sandy soils to Magude; in Gaza and Maputo Provinces.

Characteristic native biota

The most important trees are *Acacia senegal* var. *leiorhachis, Adansonia digitata, Afzelia quanzensis, Albizia forbesii, Balanites maughamii, Boscia foetida* subsp. *filipes, Cassia abbreviata, Cleistanthus schlechteri, Combretum apiculatum, C. collinum* subsp. *taborense, C. molle, C. zeyheri, Commiphora pyracanthoides, Crossopteryx febrifuga, Dalbergia melanoxylon, Drypetes mossambicensis, Erythrophleum lasianthum, Guibourtia conjugata, Hymenocardia ulmoides, Lannea antiscorbutica, Lannea schweinfurthii* var. *stuhlmannii, Mundulea sericea, Peltophorum africanum, Pseudolachnostylis maprouneifolia, Pteleopsis myrtifolia, Pterocarpus lucens, Sclerocarya birrea* subsp. *caffra, Strychnos madagascariensis, Terminalia sericea, Vangueria infausta,* and *Xeroderris stuhlmannii.*

Shrubs include *Alchornea laxiflora, Baphia massaiensis* subsp. *obovata, Coptosperma zygoon, Croton pseudopulchellus, Dalbergia nitidula, Ehretia amoena, Grewia bicolor, Uvaria gracilipes, Vepris bremekampii,* and *Vitex ferruginea.*

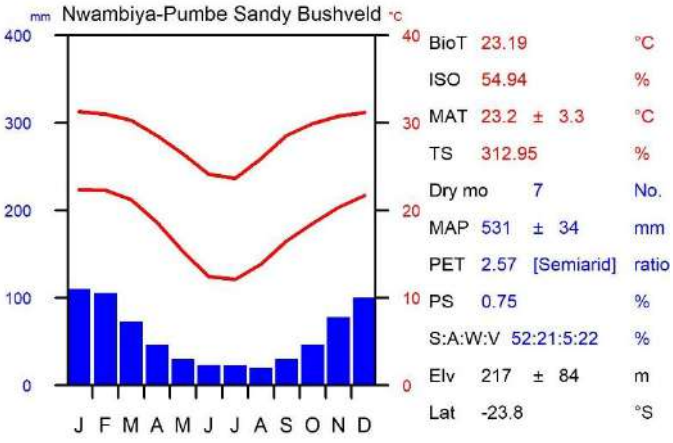
Climbers noted are *Combretum mossambicensis, Hugonia orientalis, Merremia tridentata,* and *Rhynchosia resinosa.*

Herbaceous species recorded are *Brachiaria nigropedata, Cymbopogon pospischilii, Digitaria eriantha, Enneapogon cenchroides, Eragrostis pallens, E. superba, Heliotropium steudneri, Indigofera filipes, Panicum maximum, Perotis patens, Phyllanthus parvulus, Pogonarthria squarrosa, Schmidtia pappophoroides, Urochloa mossambicensis,* and *Vigna unguiculata.*

Abiotic environment and climate

Altitude range of 60 to 450 m asl with a mean of 217 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 69.6% while the similarly measured clay content is 18.3%. Soil pH is 6.6.

Precipitation during driest quarter is 28.8 mm.



Species of Conservation Importance

Biogeographic Anomalies

Acridocarpus natalitius var. *linearifolius*, *Coptosperma zygoon*.

Photographic credits *left & right*: Lebombo Mts, Limpopo National Park, Maputo Province. photos: M. Stalmans.

RLE Assessment

Assessment Summary

This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 7.85% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 153 10 x 10 km grid cells and an EOO of 17231.86 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.01% of the current distribution faces >90 percent degradation severity, 0.22% of the distribution faces >70 percent degradation severity, and 7.1% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

TEMBE SANDY BUSHVELD

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Pradaria arbustiva arenosa do Tembe
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Lowveld Savanna

Description

Open to closed woodland with a canopy 5-10 m tall, on deep sandy soils.

Distribution

Extending from the Incomati River, southwards on sandy soils into South Africa. Occurring in Gaza and Maputo Provinces.

Characteristic native biota

Due to this vegetation type's proximity to Maputo, it is very well sampled botanically, but is also extremely threatened due to considerable human impact. The recorded trees are *Afzelia quanzensis, Acacia burkei, Albizia adianthifolia* var. *adianthifolia, A. petersiana* subsp. *evansii, Albizia versicolor, Brachylaena discolor, B. huillensis, Cleistanthus schlechteri, Combretum molle, Commiphora zanzibarica, Dialium schlechteri, Erythrophleum lasianthum, Garcinia livingstonei, Gardenia volkensii, Lannea stuhlmannii* subsp. *schweinfurthii, Maerua angolensis, Newtonia hildebrandtii* var. *hildebrandtii, Ozoroa engleri, O. obovata* var. *elliptica, Peltophorum africanum, Pterocarpus angolensis, Sclerocarya birrea, Spirostachys africana, Strychnos madagascariensis, S. spinosa, Tabernaemontana elegans, Terminalia sericea, Trichilia emetica* subsp. *emetica*, and *Ziziphus mucronata.*

Shrubs and small trees recorded are *Acacia schweinfurthii, Acalypha* spp., *Albertisia delagoensis, Annona senegalensis, Antidesma membranaceum, A. rufescens, Artabotrys brachypetalus, Baccharoides adoensis, Boscia foetida* subsp. *rehmanniana, Bridelia cathartica, Bullockia setiflora, Cadaba natalensis, Catunaregam taylori, Cladostemon kirkii, Coddia rudis, Combretum celastroides* subsp. *orientale, Croton gratissimus* var. *gratissimus, C. pseudopulchellus, Dalbergia nitidula, Dichrostachys cinerea* subsp. *africana, Ehretia amoena, Erythrina humeana, Erythroxylum delagoense, E. emarginatum, Flueggea virosa, Grewia gracillima, G. microthyrsa, Gymnanthemum coloratum* subsp. *coloratum, Gymnosporia senegalensis, Tecomaria capensis, Lagynias monteiroi, Maytenus undata, Mundulea sericea, Mystroxylon aethiopicum, Opilia amentacea, Ormocarpum trichocarpum, Pavetta catophylla, P. vanwykiana, Pluchea dioscoridis, Searsia gueinzii, Securidaca longepedunculata, Synaptolepis kirkii, Tarenna junodii, Turraea wakefieldii, Vitex harveyana, Ximenia caffra* var. *caffra,* and *Xylotheca kraussianum.*

Riparian vegetation, bush clumps or thicket patches include *Casearia gladiiformis, Celtis africana, Clausena anisata, Commiphora africana, C. schlechteri, Craibia zimmermannii, Croton menyharthii, Diospyros inhacaensis, Dracaena mannii, Euclea natalensis, Heinsia parviflora, Hymenocardia ulmoides, Monanthotaxis caffra, Monodora junodii,*

Schotia brachypetala, Sclerocroton integerrimus, Strychnos decussata, Syzygium cordatum, Trema orientalis, Vepris lanceolata, Zanthoxylum capense and the wild ginger *Aframomum angustifolium.*

Shrublets, herbs and geophytes: *Achyropsis leptostachya, Adenia hastata, Agathisanthemum bojeri, Aloe parvibracteata, A. suffulta, Aneilema arenicola, Asparagus buchananii, A. cooperi, Basananthe triloba, Blepharis maderaspatensis, Chamaecrista biensis, C. mimosoides, C. plumosa, Cissampelos hirta, C. torulosa, Cleome angustifolia* subsp. *diandra, C. bororensis, Commelina forskaolii, Convolvulus farinosus, Corchorus junodii, Crinum acaule, Crossandra fruticulosa, Crotalaria dura* subsp. *mozambica, C. laburnifolia, C. monteiroi* subsp. *monteiroi, C. sphaerocarpa* subsp. *sphaerocarpa, Cyphostemma schlechteri, Delosperma tradescantioides, Dolichos junodii, Drimia elata, Endostemon tereticaulis, Eriosema psoraleoides, Eulophia speciosa, Geigeria ornativa, Gladiolus dalenii, Glinus bainesii, Helichrysum candolleanum, Heliotropium ovalifolium, Hermannia boraginiflora, H. glanduligera, H. micropetala, Hermbstaedtia odorata* var. *odorata, Hibiscus vitifolius, Hybanthus enneaspermus, Indigofera charlieriana, I. podophylla, I. schimperi* var. *schimperi, Ipomoea bolusiana, I. venosa* subsp. *stellaris, Jasminum multipartitum, Justicia exigua, Kalanchoe sexangularis, Kleinia longiflora, Limeum viscosum, Lotononis bainesii, Macrotyloma axillare, Malvastrum coromandelianum, Melanthera scandens* subsp. *dregei, Melhania acuminata, Melinis repens* subsp. *repens, Mimosa pigra, Neonotonia wightii* var. *longicauda, Nesphostylis junodii, Nidorella microcephala, Oldenlandia affinis, Oxygonum delagoense, Phyllanthus heterophyllus, Polygala franciscii, P. producta, P. sphenoptera, Rhynchosia caribaea, R. minima, R. sublobata, Salacia kraussii, Senecio barbertonicus, Sida cordifolia, Smilax anceps, Solanum campylacanthum, S. catombelense, Striga junodii, Stylochaeton natalensis, Stylosanthes fruticosa, Tephrosia forbesii* subsp. *forbesii, T. purpurea* var. *delagoensis* and subsp. *canescens, Trianthema mozambiquensis, Tricliceras lacerata, Triumfetta pilosa* var. *effusa, T. rhomboidea* var. *rhomboidea, Vigna luteola, V. unguiculata, Volkameria glabra*, and *Zehneria pallidinerva.*

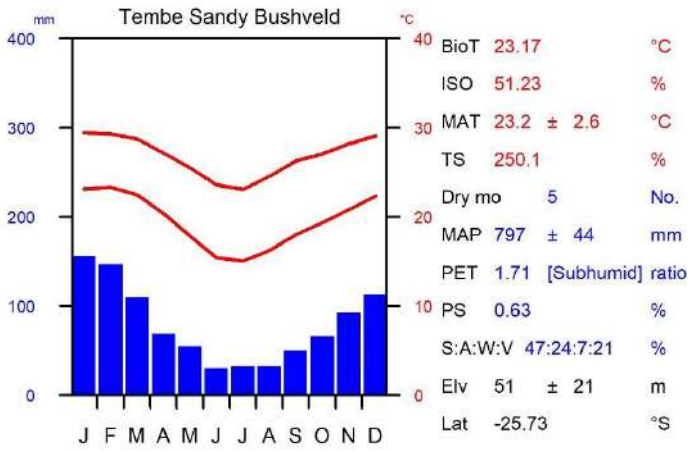
Climbers include *Acridocarpus natalitius* var. *linearifolius, Capparis fascicularis, C, sepiaria* var. *citrifolia, Cissus rotundifolius, Dalbergia obovata, Grewia caffra, Helinus integrifolius, Landolphia kirkii, Prionostemma delagoensis* var. *delagoensis*, and *Secamone parvifolia.*

Graminoides noted are *Alloteropsis papillosa, Aristida congesta* subsp. *barbicollis, A. stipitata* subsp. *gracilifolia, Brachiaria deflexa, Cenchrus biflorus, C. incertus, Chloris gayana, C. virgata, Cynodon dactylon, Cyperus distans. C. rotundus* f. *rotundus, Dactyloctenium giganteum, Dichanthium annulatum* var. *papillosum, Digitaria abyssinica, D. eriantha* subsp. *eriantha, Digitaria longiflora, D. perrottetii, Diheteropogon amplectens, Echinochloa pyramidalis, Eragrostis aspera, E. ciliaris, Eragrostis cylindriflora, E. heteromera, E. horizontalis, E. inamoena, E. moggii, E. superba, Eriochloa procera, E. stapfiana, Eustachys paspaloides, Hemarthria altissima, Heteropogon contortus, Hyperthelia dissoluta, Imperata cylindrica, Leersia hexandra, Melica minuta, Megastachya mucronata, Panicum deustum, P. fluviicola, P. maximum, Panicum stapfianum, P. subalbidum, Paspalum scrobiculatum, Perotis patens, Pogonarthria squarrosa, Sacciolepis curvata, Setaria incrassata, S. megaphylla, S. sphacelata, Sorghum bicolor* subsp. *arundinaceum, Themeda triandra, Tricholaena monachne, Urelytrum agropyroides*, and *Urochloa mossambicensis.*

Abiotic environment and climate

Altitude range of 9 to 115 m asl with a mean of 51 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 75.5% while the similarly measured clay content is 15.3%. Soil pH is 6.1.

Precipitation during driest quarter is 61.3 mm.



Species of Conservation Importance

Endemic Plant Species

Acridocarpus natalitius var. *linearifolius* [NE], *Allophylus mossambicensis* [E], *Brachychloa fragilis* [NE], *Dicliptera quintasii* [E], *Emicocarpus fissifolius* [E*], *Ipomoea venosa* subsp. *stellaris* var. *obtusifolia* [E], *Tephrosia forbesii* subsp. *forbesii* [E], *Trianthema mozambiquensis* [E], *Xylopia torrei* [E].

Threatened Plant Species

Allophylus mossambicensis [VU], *Dicliptera quintasii* [VU], *Emicocarpus fissifolius* [CR*], *Tephrosia forbesii* subsp. *forbesii* [VU], *Trianthema mozambiquensis* [DD], *Xylopia torrei* [EN].

Biogeographic Anomalies

Dicerocaryum forbesii, Pavetta vanwykiana, *Cleome bororensis*.

Photographic credits *top*: Tembe Sandy Bushveld after fire, Licuati Forest Reserve, Maputo Province. photo. J. Burrows; *bottom left*: Maputo Special Reserve. photo: M. Stalmans; *bottom right*: woodland in Maputo Special Reserve, Maputo Province. photo. M. Stalmans.

RLE Assessment

Assessment Summary

This ecosystem has declined by more than 60% since 1750 due to expansion of agriculture, urban areas and deforestation. **Vulnerable**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 64.81% decline since 1750. Vulnerable

Criterion B: This ecosystem has an AOO of 93 10 x 10 km grid cells and an EOO of 15064.31 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 12.82% of the current distribution faces >90 percent degradation severity, 25.49% of the distribution faces >70 percent degradation severity, and 72.29% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

MECUFI SANDSTONE DRY WOODLAND

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Mata seca no arenito de Mecúfi
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Swahilian Savanna

Description

Deciduous dry woodland on sandstone.

Distribution

Confined to Mozambique, from Pemba southwards to the Lurio River; Cabo Delgado Province.

Characteristic native biota

Although the species data for this vegetation type are a little sketchy, the trees recorded are *Adansonia digitata* (prominent), *Acacia latispina, A. nigrescens, A. nilotica* subsp. *kraussiana, A. polyacantha* subsp. *campylacantha, A. robusta* subsp. *usambarensis, A. seyal, Albizia adianthifolia, A. brevifolia, A. glaberrima* var. *glabrescens, A. petersiana* subsp. *petersiana, Boscia angustifolia* var. *corymbosa, Brachystegia spiciformis, B. torrei, Cassipourea mossambicensis, Cleistanthus schlechteri, Combretum collinum, Dalbergia melanoxylon, Diospyros quiloensis, Euphorbia ingens, Ficus sycomorus* subsp. *gnaphalocarpa, Kigelia africana, Maerua angolensis, Micklethwaitia carvalhoi, Sorindeia madagascariensis* (riverine), *Millettia bussei, M. usaramensis* subsp. *australis, Spirostachys africana, Vitex buchananii, V. carvalhi*, and V. *mossambicensis.*

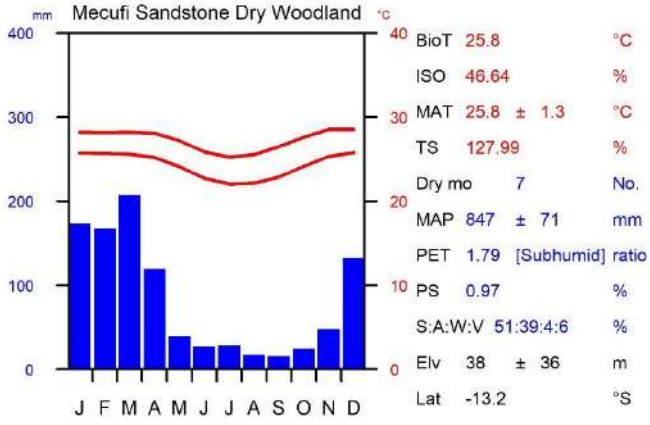
Small trees, woody shrubs and climbers include *Afrocanthium vollesenii, A. racemulosum, Bauhinia tomentosa, Bosqueiopsis carvalhoana, Buchnerodendron lasiocalyx, Canthium glaucum* subsp. *frangula, Capparis sepiaria* var. *citrifolia, C. tomentosa, Carpolobia goetzei, Chazaliella abrupta, Dalbergia bracteolata, Dichrostachys cinerea subsp. hirtipes, Diospyros loureiriana* subsp. *loureiriana, Dracaena reflexa, Entada stuhlmannii, Erythrococca kirkii, Erythroxylum platyclados, Ficus nigro-punctata, Heinsia crinita* var. *parviflora, Hugonia orientalis, Hyphaene coriacea, Maerua aethiopica, M. juncea* subsp. *juncea, Monodora grandidieri, Olax dissitiflora, Ormocarpum schliebenii, Pavetta mocambicensis, Phyllocalyx vollesenii, Synaptolepis oliveriana, Thilachium africanum, Tristellateia africana*, and *Xylotheca tettensis* var. *macrophylla.*

Small shrublets and herbs recorded *are Aerva javanica, A. lanata, Cleome gynandra, C. stricta, Clitoria ternatea, Crotalaria microcarpa, C. virgulata* subsp. *forbesii, Gisekia africana, Gossypioides kirkii, Gymnanthemum coloratum, Merremia tridentata, Mimosa pigra, Orthosiphon thymiflorus, Pavonia leptocalyx, Phyllanthus pentandrus, Senna occidentalis, Tribulus cistoides, T. terrestris* and *Vigna unguiculata.*

Abiotic environment and climate

Altitude range of 8 to 150 m asl with a mean of 38 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 64.7% while the similarly measured clay content is 22.2%. Soil pH is 6.5.

Precipitation during driest quarter is 18.3 mm.



Species of Conservation Importance

Endemic Plant Species

Acacia latispina [E], *Afrocanthium vollesenii* [NE], *Asparagus inopinatus* S.M.Burrows & J.E.Burrows, *ined.* [E], *Combretum caudatisepalum* [E], *Justicia niassensis* [E], *Pavetta mocambicensis* [E], *Premna schliebenii* [NE], *Vitex mossambicensis* [NE], *Vitex carvalhi* [NE].

Threatened Plant Species

Acacia latispina [VU], *Afrocanthium vollesenii* [VU], *Combretum caudatisepalum* [VU], *Justicia niassensis* [EN], *Pavetta mocambicensis* [EN], *Premna schliebenii* [VU], *Vitex mossambicensis* [VU], *Vitex carvalhi* [VU].

Biogeographic Anomalies

Bosquieopsis carvalhoana, Buchnerodendron lasiocalyx, Mickelthwaitia carvalhoi, Phellocalyx vollesenii.

Photographic credits *left*: *Acacia latispina*, endemic to the Rovuma Centre of Endemism, near Mecufi, Cabo Delgado Province. photo: J. Burrows; *at right*: Pemba to Mecufi, *top* photo: M. Lotter; *bottom* photo: J. Burrows.

RLE Assessment

Assessment Summary	Assessment Information
This ecosystem has seen considerable historical declines, has a highly restricted distribution, and there is evidence of continuing recent declines. Critically Endangered	**Criterion A:** Expansion of urban areas, agriculture & deforestation has caused a 80.81% decline since 1750. Endangered **Criterion B:** This ecosystem has an AOO of 11 10 x 10 km grid cells and an EOO of 581.42 km2. It has undergone substantial historical decline, and there is evidence that deforestation & other threats are leading to continuing decline. Critically Endangered **Criterion C:** Not evaluated **Criterion D:** Degradation assessment shows that 42.47% of the current distribution faces >90 percent degradation severity, 62.64% of the distribution faces >70 percent degradation severity, and 86.69% of the distribution faces >50 percent degradation severity. Least Concern **Criterion E:** Not evaluated

ANGONIA GNEISS MONTANE MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Miombo de montanha gneissica de Angónia

Biome Savannas and grasslands (T4)

Functional group Pyric tussock savannas(T4.2)

Regional Ecosystem Zambezian Dry Miombo

Description

A poorly explored area of open semi-deciduous miombo woodland.

Distribution

In north-western corner of Mozambique, between Domue and Tsangano-Sede (Tete Province), extending into Malawi.

Characteristic native biota

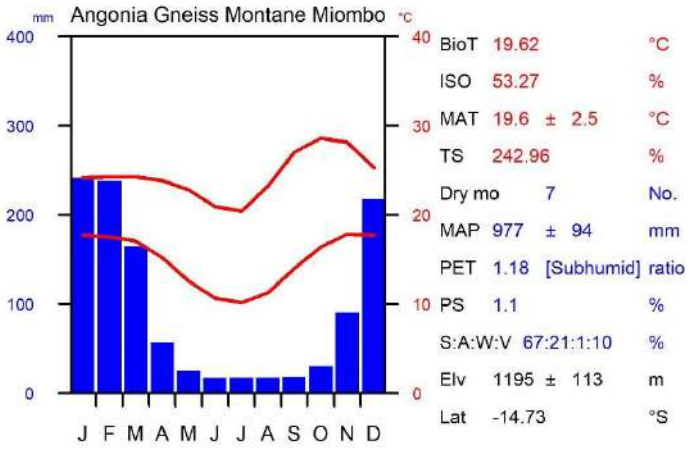
Trees are represented by *Acacia polyacantha* subsp. *campylacantha, A. sieberiana* var. *woodii, Brachystegia longifolia, B. spiciformis, Burkea africana, Combretum* spp., *Dalbergiella nyassae, Ekebergia benguelensis, Erica benguelensis, Feretia aeruginescens, Julbernardia globiflora, Pericopsis angolensis, Pterocarpus angolensis, Senna singueana, Strychnos pungens, Syzygium guineense* subsp. *guineense, Terminalia sericea,* and *Uapaca nitida.* Small trees and shrubs recorded are *Combretum platypetalum* subsp. *oatesii* and *Euclea schimperi.*

Grasses include *Eragrostis castellaneana, Hyparrhenia filipendula, H. rufa,* and *Panicum phragmitoides.*

Abiotic environment and climate

Altitude range of 1000 to 1530 m asl with a mean of 1195 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 70.6% while the similarly measured clay content is 18.0%. Soil pH is 6.0.

Precipitation during driest quarter is 12.2 mm.



Species of Conservation Importance: none recorded.

RLE Assessment

Assessment Summary

This ecosystem has seen huge historical declines, losing over 90% of its original extent. There is also evidence that climate change will greatly reduce climatically suitable area in the future. **Critically Endangered**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 91.79% decline since 1750. and this ecosystem is assessed as Critically Endangered under A3. Future climate models also predict declines in suitable climate of 83-96% between 2000 & 2050. As such this ecosystems is assessed as Critically Endangered under A2a.

Criterion B: This ecosystem has an AOO of 30 10 x 10 km grid cells and an EOO of 2953.47 km2 Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 6.14% of the current distribution faces >90 percent degradation severity, 34.45% of the distribution faces >70 percent degradation severity, and 95.97% of the distribution faces >50 percent degradation severity. Vulnerable

Criterion E: Not evaluated

BARUE ESCARPMENT MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Miombo da escarpa de Báruè
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Zambezian Dry Miombo

Description

Deciduous dry miombo occurring at altitudes of between 250 and 860 metres, often in rocky habitats.

Distribution

Along the north-eastern slopes of the Barue plateau area, between Guro and Nhamadze in northern Manica Province. Also in Zimbabwe.

Characteristic native biota

Brachystegia boehmii, B. spiciformis, B. utilis, Julbernardia globiflora represent the miombo components of these woodlands, sometimes together being dominant, but often mixed with, or forming mosaics with, the following: *Acacia amythethophylla, A. burkei, A. gerrardii, A. goetzei* subsp. *goetzei, A. nilotica* subsp. *kraussiana, A. polyacantha* subsp. *campylacantha, A. robusta, A. sieberiana* var. *sieberiana, Adansonia digitata, Afzelia quanzensis, Albizia brevifolia, A. harveyi, A. versicolor, Balanites maughamii, Bauhinia galpinii, B. petersiana* subsp *petersiana, Berchemia zeyheri, Brackenridgea zanguebarica, Burkea africana, Cleistochlamys kirkii, Combretum apiculatum, C. collinum, C. molle, C. zeyheri, Commiphora africana, Crossopteryx febrifugum, Cussonia arborea, C. spicata, Dalbergia boehmii, D. melanoxylon, D. nitidula, Dalbergiella nyassae, Diospyros kirkii, D. mespiliformis, Diplorhynchus condylocarpon, Entada abyssinica, Erythrophleum africanum, Ficus stuhlmannii, F. sur, Ficus sycomorus* subsp. *gnaphalocarpa, Gardenia ternifolia* var. *goetzei, Kigelia africana, Kirkia acuminata, Lannea discolor, L. schimperi, Markhamia obtusifolia, M. zanzibarica, Parinari curatellifolia, Philenoptera bussei, Piliostigma thonningii, Pseudolachnostylis maprouneifolia, Pteleopsis myrtifolia, Pterocarpus angolensis, P. brenanii, P. rotundifolius* subsp. *rotundifolius, Schrebera alata, Sclerocarya birrea* subsp. *caffra, Steganotaenia araliacea, Strychnos madagascariensis, S. spinosa, Swartzia madagascariensis, Syzygium guineense* subsp. *guineense, Tabernaemontana elegans, Terminalia sericea, T. stenostachya, Trichilia capitata, Uapaca kirkiana, U. sansibarica, Vangueria infausta, V. payos* var. *glabrescens, Xeroderris stuhlmannii, Ziziphus mauritiana* and *Z. mucronata* subsp. *mucronata*.

Small trees and woody shrubs recorded are *Annona senegalensis, Bridelia cathartica, Catunaregam taylori, Dichrostachys cinerea* subsp. *nyassana, Diospyros loureiriana, D. lycioides* subsp. *sericea, Elephantorrhiza goetzei* subsp. *goetzei, Flacourtia indica, Grewia bicolor, Hexalobus monopetalus* var. *obovatus, Lagynias dryadum, Ochna schweinfurthii, Ormocarpum trichocarpum,*

Ozoroa obovata, Pavetta schumanniana, Phyllanthus reticulatus, Protea angolensis var. *divaricata, Rourea orientalis, Senna petersiana, Synaptolepis alternifolia, Ximenia americana* subsp. *microphylla* and *Ximenia caffra* var. *caffra.*

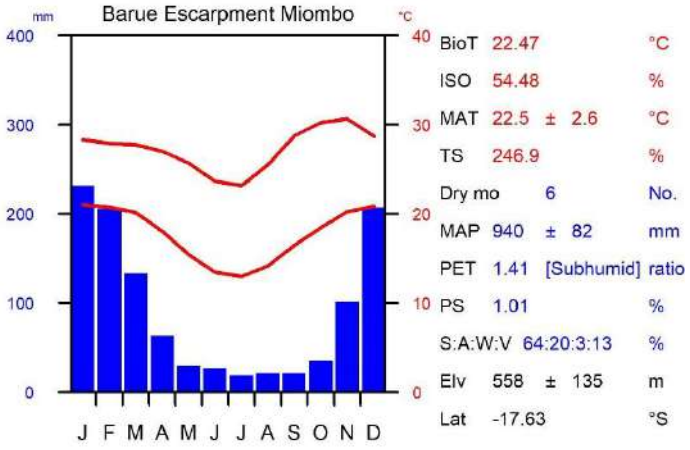
Riparian woodland in this type includes *Antidesma venosum, Breonadia salicina, Cordyla africana, Diospyros mespiliformis, Erythrophleum suaveolens, Ficus capreifolia, Khaya anthotheca, Kigelia africana, Philenoptera violacea, Rauvolfia caffra, Syzygium cordatum*, with understorey species such *as Kraussia floribunda, Monodora junodii, Psydrax livida*, and with lianes such as *Adenia gummifera, Dalbergia arbutifolia, D. fischeri, Artabotrys brachypetalus, Grewia flavescens* and *Landolphia kirkii*. At lower altitudes, such as along the Pungwe River, additional species such as *Berchemia discolor, Combretum imberbe, Ficus bussei, F. sycomorus, Lannea schweinfurthii, Trichilia emetica* and *Terminalia prunioides* are added to the list.

Soft shrubs and herbaceous species include *Cissus cornifolia, Crotalaria anthyllopsis, C. hyssopifolia, Flemingia grahamiana, Gymnanthemum thomsoniana, Hibiscus meeusei, Lapeirousia erythrantha, Margaretta rosea* subsp. *whytei, Neorautanenia mitis, Scutellaria schweinfurthii* subsp. *paucifolia, Sphenostylis erecta*, *Thunbergia petersiana*, and *Xerophyta humilis*. The few grasses recorded are *Alloteropsis semialata, Cenchrus purpureus, Hyparrhenia finitima,* and *Hyperthelia dissoluta.*

Abiotic environment and climate

Altitude range of 265 to 855 m asl with a mean of 558 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 60.7% while the similarly measured clay content is 24.0%. Soil pH is 6.0.

Precipitation during driest quarter is 31.6 mm.



Species of Conservation Importance: none recorded.

Photographic credits Coutada 9, Manica Province. photo: M. Stalmans.

RLE Assessment

Assessment Summary	Assessment Information
This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**	**Criterion A:** Expansion of urban areas, agriculture & deforestation has caused a 11.73% decline since 1750. Least Concern **Criterion B:** This ecosystem has an AOO of 89 10 x 10 km grid cells and an EOO of 9705.65 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern **Criterion C:** Not evaluated **Criterion D:** Degradation assessment shows that 0.02% of the current distribution faces >90 percent degradation severity, 1.46% of the distribution faces >70 percent degradation severity, and 17.25% of the distribution faces >50 percent degradation severity. Least Concern **Criterion E:** Not evaluated

INHAMBANE COASTAL MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Miombo costeiro de Inhambane
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Zambezian Dry Miombo

Description

Deciduous coastal miombo woodland and mixed sem-deciduous woodland varying in height from 6 to 15 m high.

Distribution

Southernmost miombo unit, extending along the Mozambique coast from Pomene southwards as far as Xai Xai. Occurring in Gaza and Inhambane Provinces. Limited to Mozambique.

Characteristic native biota

Besides the two main miombo woodland elements, *Brachystegia spiciformis* and *Julbernardia globiflora*, which together may form pure areas of woodland, these two species are more often intermixed with the following trees: *Acacia burkei, A. gerrardii, Afzelia quanzensis, Albizia adianthifolia, A. versicolor, A. forbesii, Antidesma venosum, Balanites maughamii, Burkea africana, Cladostemon kirkii, Cleistanthus schlechteri, Combretum molle, Commiphora schlechteri, Cordyla africana, Dalbergia boehmii, D. nitidula, Dialium schlechteri, Dolichandrone alba, Garcinia livingstonei, Guibourtia conjugata, G. sousae, Hyphaene petersiana, Piliostigma thonningii, Sclerocarya birrea* subsp. *caffra, Securidaca longepedunculata, Strychnos madagascariensis, S. spinosa, Swartzia madagascariensis,* and *Tabernaemontana elegans*.

Shrubs, small trees and climbers include *Artabotrys brachypetalus, Baphia kirkii* subsp. *ovata, B. massaiensis* subsp. *obovata, Canthium armatum, Capparis erythrocarpos, Cassia afrofistula* var. *afrofistula, Catunaregam obovata, Clerodendrum robustum, Dichrostachys cinerea* subsp. *forbesii, Diospyros villosa* var. *villosa, Ehretia amoena, Elaeodendron schlechterianum, Encephalartos ferox, Erythroxylum delagoensis, Grewia sulcata, Heinsia crinita* subsp. *parviflora, Hugonia orientalis, Jasminum multipartitum, Lagynias lasiantha, Maerua juncea* subsp. *juncea, M. parviflora, M. triphylla* var. *pubescens, Maprounea africana, Monanthotaxis caffra, Monodora junodii* var. *macrantha, Opilia amentacea, Oxyanthus latifolius, Pavetta catophylla, Pleurostylia capensis, Searsia tenuinervis, Senna petersiana, Sphaerocoryne gracilis, Synaptolepis oliveriana, Tricalysia delagoensis, Turraea nilotica, T. wakefieldii,* and *Vitex payos* var. *glabrescens.*

Geoxylic suffrutices, or geoxyles, are represented by *Albertisia delagoensis, Ochna natalitia, Parinari capensis* subsp. *incohata* and *Salacia kraussii.*

Softer shrubs and herbaceous species include *Aeschynomene cristata, Cordylostigma virgatum, Crotalaria dura, C. cleomifolia, C. goodiiformis, C. monteiroi* subsp. *monteiroi, C. natalitia* subsp. *natalitia, C. quartiniana, C. vasculosa, C. virgulata* subsp. *grantiana, Eriosema parviflorum, E. psoraleoides, Euphorbia cyathophora, Gossypioides kirkii, Gymnanthemum coloratum, Indigofera inhambanense, I. mendoncae, I. podophylla, I. schimperi, Justicia kirkiana, Melhania forbesii, Microsorum scolopendria, Pavonia leptocalyx, Polygala francisci, Pseudarthria hookeri, Tephrosia forbesii* subsp. *forbesii, T. purpurea subsp. delagoensis*, and *Thesium inhambanense.*

Grasses recorded are *Andropogon eucomus* subsp. *huillensis, A. schirensis, Aristida leucophaea, A. stipitata* subsp. *graciliflora, Brachiaria chusqueoides, B. nigropedata, Cenchrus unisetus, Dactyloctenium austral, D. geminatum, Digitaria argyrotricha, Diplachne fusca, Eriochloa meyeriana, Eragrostis chapelieri, E. lappula, Megastachya mucronata, Perotis patens, Pogonarthria squarrosa, Sacciolepis africana, Sorghastrum stipoides, Trachypogon spicatus,* and *Triraphis schinzii.*

Areas of *Brachystegia torrei*-dominated woodland, as well as pockets of *Androstachys johnsonii* forest, may also occur within this vegetation type. In addition, denser patches of coastal forest occur scattered throughout this vegetation type, with trees such *as Apodytes dimidiata, Bligbia unijugata, Casearia gladiiformis, Dialium schlechteri, Diospyros inhacaensis, Dracaena mannii, Drypetes arguta, Ekebergia capensis, Erythrophleum lasianthum, Euclea natalensis* subsp. *natalensis, Ficus exasperata, F. lutea, Lannea antiscorbutica, Manilkara discolor, Margaritaria discoidea* var. *fagifolia, Milicia excelsa, Millettia ebenifera, M. stuhlmannii, Morus mesozygia, Phoenix reclinata, Pleurostylia opposita, Pteleopsis myrtifolia, Rothmannia fischeri* subsp. *moramballae, Sclerocroton integerrimus, Trema orientalis, Vepris bremekampii, V. lanceolata,* and *Voacanga thouarsii.*

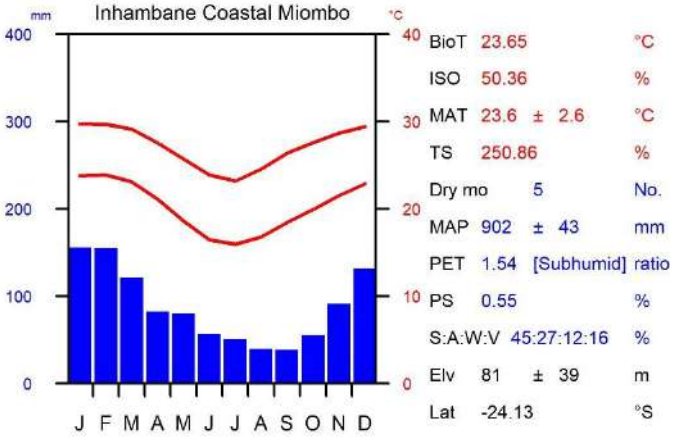
The understorey is composed mainly of *Acacia ataxacantha, Alchornea laxiflora, Callichilia orientalis, Chazaliella abrupta, Coffea racemosa, C. zanguebariae, Coleotrype natalensis, Combretum celastroides* subsp. *orientale, Combretum butyrosum, Coptosperma littorale, C. nigrescens, Craibia zimmermannii, Croton steenkampianus, Euphorbia baylissii, Grewia caffra, Hyperacanthus microphyllus, Indigofera fulgens* subsp. *fulgens, Justicia campylostemon, Kraussia floribunda, Pavetta uniflora, Rytigynia umbellulata, Salacia leptoclada, Sclerochiton apiculatus, S. coeruleus, Strychnos panganensis, Suregada zanzibarensis, Tarenna junodii, T. pavettoides* subsp. *affinis*, and *Xylopia torrei.*

<Lianes and climbers, mostly found in the forest patches, consist of *Ancylobotrys petersianus, Canavalia africana, Capparis brassii, Cissampelos hirta, Cissus rotundifolia, Dalbergia obovata, Landolphia kirkii, Rhoicissus revoilii, Salacia elegans, S. madagascariensis, Scutia myrtina, Strophanthus kombe*, and *S. petersianus.*<

Abiotic environment and climate

Altitude range of 11 to 190 m asl with a mean of 81 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 80.3% while the similarly measured clay content is 11.2%. Soil pH is 6.0.

Precipitation during driest quarter is 87.1 mm.



Species of Conservation Importance

Endemic Plant Species

Adenopodia schlechteri [E], *Croton aceroides* [E], *Conostomium gazense* [E], *Eragrostis sericata* [E], *Euphorbia baylissii* [E], *Indigofera mendoncae* [E], *Millettia ebenifera* [E], *Polygala francisci* [E], *Psydrax micans* [NE], *Tephrosia forbesii* subsp. *forbesii* [NE], *Thesium inhambanense* [E*].

Threatened Plant Species

Adenopodia schlechteri [VU], *Coffea zanguebariae* [VU], *Croton aceroides* [EN], *Euphorbia baylissii* [VU], *Indigofera mendoncae* [DD], *Polygala francisci* [VU], *Psydrax micans* [VU], *Tephrosia forbesii* subsp. *forbesii* [VU].

Photographic credits Road to Barra Lodge, Inhambane Province. photo: M. Lotter.

RLE Assessment

Assessment Summary	Assessment Information
This ecosystem has seen substantial historical declines, losing over 70% of its original distribution. **Endangered**	**Criterion A:** Expansion of urban areas, agriculture & deforestation has caused a 71.96% decline since 1750. Endangered **Criterion B:** This ecosystem has an AOO of 227 10 x 10 km grid cells and an EOO of 27548.54 km2. It has undergone substantial historical decline, and there is evidence that deforestation & other threats are leading to continuing decline. Vulnerable **Criterion C:** Not evaluated **Criterion D:** Degradation assessment shows that 1.08% of the current distribution faces >90 percent degradation severity, 9.12% of the distribution faces >70 percent degradation severity, and 75.42% of the distribution faces >50 percent degradation severity. Least Concern **Criterion E:** Not evaluated

LUGENDA LOWLAND DRY MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Miombo seco das terras baixas de Lugenda
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas(T4.2)
Regional Ecosystem Zambezian Dry Miombo

Description

Deciduous miombo woodland mainly occurring on granite derived sandy soils.

Distribution

In northern Mozambique, from Negamano on the Rovuma River, southwards and westwards up the Rovuma and Lugenda River catchments, into Niassa Special Reserve and far south as Naneuma (north of Marrupa). Occurring in Cabo Delgado and Niassa Provinces.

Characteristic native biota

A drier form of miombo woodland, dominated by *Julbernardia globiflora* and *Brachystegia spiciformis*, with *B. boehmii* locally common. In somewhat drier areas the woodland is shorter and more open. *Combretum* species *(C. adenogonium, C. apiculatum, C. kirkii, C. molle, C. mossambicense, C. psidioides, C. zeyheri*) are common, with fewer *Brachystegia* or *Julbernardia* trees. Other species include *Albizia amara* subsp. *amara, Annona senegalensis, Azania garckeana, Balanites aegyptiaca, Baphia massaiensis* subsp. *gomesii, Boscia angustifolia, B. mossambicensis, Brackenridgea zanguebarica, Carpodiptera africana, Commiphora pteleifolia, Cordia goetzei, Diplorhynchus condylocarpon, Diospyros squarrosa, D. kirkii, Dombeya acutangula, Entada chrysostachya, Flacourtia indica, Grewia inaequilaterale, Holarrhena pubescens, Homalium abdessammadii, Hymenocardia acida, Markhamia zanzibarica, Monanthotaxis obovata, Olax dissitiflora, Ozoroa insignis* subsp. *reticulata, Pavetta schumanniana, P. refractifolia, Philenoptera bussei, Piliostigma thonningii, Pteleopsis myrtifolia, Pterocarpus angolensis, Rauvolfia mombasiana, Steganotaenia araliacea, Sterculia quinqueloba, Stereospermum kunthianum, Swartzia madagascariensis, Syzygium guineense, Tamarindus indica, Terminalia trichopoda, Vitex buchananii, V. mombassae, Xylotheca tettensis,* and *Ziziphus abyssinica.*

Herbaceous species include *Barleria spinulosa, Blepharis affinis,* and *Dioscorea schimperiana.*

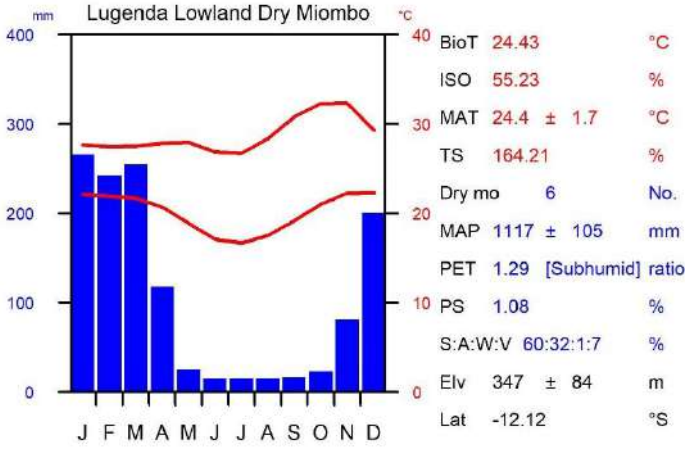
Closer to the Lugenda River a drier woodland type, dominated by *Millettia stuhlmannii* becomes common, interspersed with drier vegetation of *Acacia*-dominated wooded grassland in and around pans and small patches of *Euphorbia cooperi* thicket on cemented soils. *Hyphaene coriacea* palms are locally common.

The transition of woodland types across the landscape is from deeper sandy soils on broad ridges through drier woodland on the slopes, to the *Millettia* and *Acacia* woodland types on soils with lower moisture storage capacity.

Abiotic environment and climate

Altitude range of 170 to 530 m asl with a mean of 347 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 64.3% while the similarly measured clay content is 22.9 Soil pH is 6.1.

Precipitation during driest quarter is 5.4 mm.



Species of Conservation Importance:

Endemic Plant Species

Habenaria hirsutissima [E], *Hugonia grandiflora* [NE].

Threatened Plant Species

Hugonia grandiflora [EN].

Photographic credits Niassa Game Reserve, Niassa Province. photo: M. Lotter.

RLE Assessment

Assessment Summary

This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 0.75% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 315 10 x 10 km grid cells and an EOO of 39095.11 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0% of the current distribution faces >90 percent degradation severity, 0.05% of the distribution faces >70 percent degradation severity, and 2.85% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

LURIO VALLEY DRY MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Miombo seco do vale do Lúrio
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Zambezian Dry Miombo

Description

Dry deciduous miombo woodland.

Distribution

Confined to Mozambique, from Nacivare to Cuamba in the south, as well as the drier interior of the Messalo and Montepuez River catchments. Occurring in Cabo Delgado, Nampula, and Niassa Provinces.

Characteristic native biota

The miombo component is composed of *Brachystegia spiciformis, B. floribunda* (frequent in the western reaches), *B. boehmii, B. manga* and *Julbernardia globiflora*. Other trees are *Acacia burkei, A. gerrardii, A. goetzei* subsp. *goetzei, A. latistipulata, A. nigrescens, A. nilotica* subsp. *kraussiana, A. pilispina, A. polyacantha* subsp. *campylacantha, A. robusta* subsp. *usambarensis, Albizia anthelmintica, A. harveyi, Amblygonocarpus andongensis, Boscia salicifolia, Brackenridgea zanguebarica, Combretum adenogonium, C. andradae, C. collinum, C. kirkii, C. molle, C. psidioides, Commiphora glandulosa, C. mossambicensis, Crossopteryx febrifuga, Dalbergia boehmii, D. nitidula, Diospyros kirkii, D. mespiliformis, D. truncatifolia, Diplorhynchus condylocarpon, Dombeya shupangae, Entada abyssinica, Ficus petersii, F. sansibarica* subsp. *sansibarica, Garcinia huillensis, G. livingstonei, Harrisonia abyssinica, Maerua angolensis, Markhamia obtusifolia, Millettia bussei, M. stuhlmannii, Olax dissitiflora, Parinari curatellifolia, Pericopsis angolensis, Philenoptera bussei, P. violacea, Piliostigma thonningii, Pseudolachnostylis maprouneifolia, Pterocarpus angolensis, P. rotundifolius* subsp. *polyanthus, Rinorea elliptica, Sclerocarya birrea* subsp. *caffra, Sterculia quinqueloba, Strychnos madagascariensis, S. spinosa, Swartzia madagascariensis, Thespesia garckeana, Uapaca kirkiana, U. nitida,* and *Xeroderris stuhlmannii.*

Small trees and woody shrubs *are Annona senegalensis, Antidesma rufescens, Baphia massaiensis* subsp. *gomesii, Bauhinia galpinii, B. petersianus, Catunaregam stenocarpa, Cola mossambicensis, Dalbergia melanoxylon, Flueggea virosa, Gymnosporia senegalensis, Mundulea sericea, Ormocarpum kirkii, Phyllanthus ovalifolius, Premna schliebenii, Protea angolensis* var. *divaricata, Rourea orientalis, Senna petersiana, Turraea nilotic*a, and *Xylotheca tettensis* var. *macrophylla*.

Soft shrubs, climbers and herbaceous species recorded are *Aeschynomene minutiflora* subsp. *grandiflora, A. uniflora, Burnatia enneandra, Cissus cornifolia, C. rubiginosa, Clematis uhehensis, Cordylostigma longifolium, Crotalaria barkae, C. cephalotes, Crotalaria laburnifolia* subsp. *laburnifolia, C. lanceolata, C. microcarpa, C. reptans, Dolichos kilimandscharicus* var. *kilimandscharicus, D. simplicifolius, Eclipta prostrata, Gladiolus atropurpureus, G. decoratus, Hibiscus vitifolius* subsp. *vitifolius, Hygrophila auriculata, Indigofera erythrogramma, I. fulvopilosa, Justicia striata* var. *striata, Lotus arabicus, Mimosa pigra, Polycarpaea eriantha, Pseudarthria hookeri, Schlechterina mitostemmatoides, Tritonia laxifolia, Vernonia galamensis* var. *australis, Vigna unguiculata* subsp. *dekindtiana, V. vexillat*a, and *Wajira grahamiana.*

Grasses noted here are *Andropogon gayanus, Aristida adscensionis, Bewsia biflora, Bothriochloa bladhii, Briza maxima, Chloris virgata, Cymbopogon giganteus, Dactyloctenium giganteum, Diectomis fastigiata, Digitaria ciliaris, Diheteropogon amplectens* var. *amplectens, Echinochloa crus-galli, E. haploclada, E. holubii. E. pyramidalis, Eragrostis aspera, E. chapelieri, E. ciliaris, E. cylindriflora, E. patentissima, E. rotifer, Eriochloa fatmensis, E. macclounii, Euclasta condylotricha, Hackelochloa granularis, Heteropogon contortus, Hyparrhenia dichroa, H. familiaris, H. filipendula, H. hirta, H. rufa, H. schimperi, Hyperthelia dissoluta, Leptocarydion vulpiastrum, Loudetia simplex, Melica minuta, Melinis repens, Oryza longistaminata, Panicum gracilicaule, P. maximum, P. trichocladum, Pennisetum glaucum, P. polystachion* subsp. *polystachion, P. purpureum, Schizachyrium exile, Sorghastrum bipennatum, S. incompletum, Sorghum versicolor, Sporobolus panicoides, Stereochlaena cameronii, Themeda triandra, Tragus berteronianus, Tristachya leucothrix, T. superba, Urochloa mosambicensis*, and *Zonotriche inamoena*. Sedges recorded are *Bulbostylis hispidula* subsp. *hispidula, Cyperus haspan, C. involucratus, C. tenuis, Fimbristylis exilis, Kyllinga squamulata*, and *Pycreus pelophilus.*

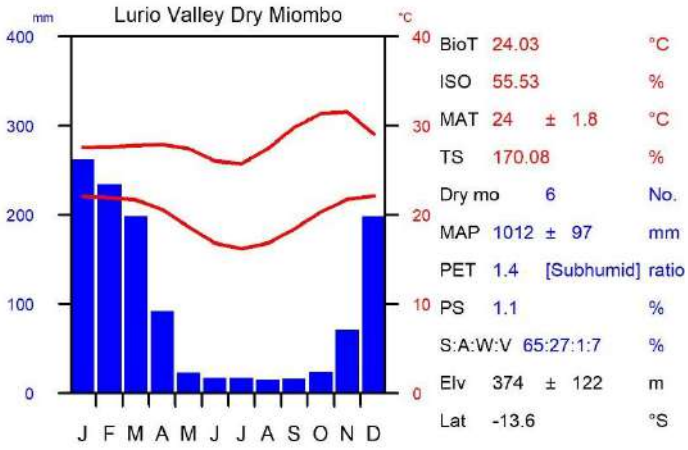
Rocky hills and outcrops, more fully described under Northern Inselberg Woodland, have the following recorded for this vegetation type: *Albizia tanganyicensis, Brachystegia bussei, Aloe chabaudii* var. *chabaudii, A. christianii, Aristida diminuta, Euphorbia contorta, E. corniculata, E. matabelensis, Monanthotaxis obovata, Xerophyta kirkii,* and *X. suaveolens* var. *suaveolens.*

Riverine woodland is composed typically of *Albizia glaberrima* subsp. *glabrescens, A. versicolor, Combretum imberbe, Cordyla africana, Diospyros mespiliformis, Ficus sycomorus* subsp. *sycomorus, Khaya anthotheca, Sterculia appendiculata, Tamarindus indica, Trichilia emetica, Zanha golungensis*, with shrubs and climbers such as *Capparis tomentosa, Combretum microphyllum, Dalbergia arbutifolia, D. fischeri, Deinbollia borbonica, Ficus verruculosa, Lagenaria sphaerica, Physostigma mesoponticum, Psophocarpus palustris, Saba comorensis, Sesbania bispinosa*, and *Tiliacora funifera.*

Abiotic environment and climate

Altitude range of 105 to 615 m asl with a mean of 374 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 62.5% while the similarly measured clay content is 23.3%. Soil pH is 6.0.

Precipitation during driest quarter is 8 mm.



Species of Conservation Importance

Endemic Plant Species

Acacia latistipulata [NE], *Aloe argentifolia* [E*], *Lepidagathis plantaginea* [NE], *Syncolostemon namapaensis* [NE], *Tricliceras lanceolatum* [E].

Threatened Plant Species

Acacia latistipulata [VU], *Aloe argentifolia* [VU*], *Lepidagathis plantaginea* [EN], *Strophanthus hypoleucos* [VU] *Tricliceras lanceolatum* [VU].

Photographic credits All photos from Nantulo district, between Montepuez and Mueda, Cabo Delgado. photos: J. Burrows.

RLE Assessment

Assessment Summary

Found in the Northeast region of Mozambique, this ecosystem has a restricted geographic distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 20.33% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 432 10 x 10 km grid cells and an EOO of 59337.44 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.35% of the current distribution faces >90 percent degradation severity, 2.71% of the distribution faces >70 percent degradation severity, and 24.5% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

MARAVIA PLATEAU MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Miombo do Planalto de Maravia
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Zambezian Dry Miombo

Description

Dry deciduous miombo woodland mostly associated with granite hills. Relatively poorly collected and therefore not well known.

Distribution

Along the Maravia Plateau on the Zambian border (also occurring in Zambia), from Zambue in the west to Chipiri in the east, Tete Province.

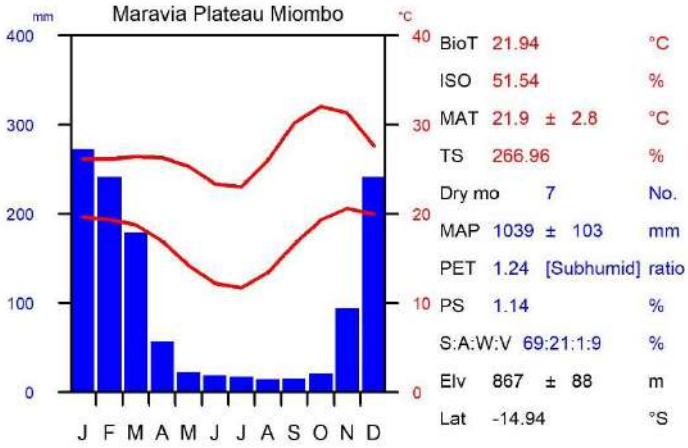
Characteristic native biota

Trees recorded are the miombo elements of *Brachystegia floribunda, B. boehmii, B. manga, B. utilis, B. glaucescens, B. spiciformis,* and *Julbernardia globiflora*; with additional trees recorded being *Albizia antunesiana, A. petersiana, Afzelia quanzensis, Crossopteryx febrifuga, Diplorhynchus condylocarpon, Monotes africana, Pericopsis angolensis, Pterocarpus angolensis,* and *Terminalia sericea* and *Uapaca kirkiana.* Small trees and shrubs noted are *Afrocanthium burttii* subsp. *burttii*, *Bauhinia petersiana, Dombeya burgessiae, Elephantorrhiza goetzei, Flacourtia indica, Gymnanthemum amygdalinum, Ormocarpum kirkii, Psychotria eminiana* subsp. *eminiana, Tricalysia coriacea,* and *Vangueriopsis lanciflora.* Ground flora contains, among others, *Gardenia subacaulis, Cryptosepalum maraviense, Crotalaria cephalotes, Ascolepis lineariglumis, Enneapogon cenchroides, Oryza longistaminata.* Riparian woodland trees include *Acacia polyacantha* subsp. *campylacantha*, *Breonadia salicina, Chionanthus battiscombei, Ficus sycomorus* subsp. *sycomorus, F. verruculosa* and *Faidherbia albida.*

Abiotic environment and climate

Altitude range of 700 to 1005 m asl with a mean of 867 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 61.2% while the similarly measured clay content is 23.1%. Soil pH is 6.0.

Precipitation during driest quarter is 7.1 mm.



Species of Conservation Importance

Biogeographic Anomalies

Afrocanthium burttii subsp. *burttii* is known only from this vegetation type in Mozambique.

Photographic credits *Top & bottom*: between Bene and Fingoe, Tete Province. photos: J. Burrows.

RLE Assessment

Assessment Summary

This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 23.52% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 223 10 x 10 km grid cells and an EOO of 22575.59 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B.

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0% of the current distribution faces >90 percent degradation severity, 2.16% of the distribution faces >70 percent degradation severity, and 28.38% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

MEMBA DRY MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Miombo seco de Memba
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Zambezian Dry Miombo

Description

A deciduous woodland and thicket mosaic with sparse miombo or miombo patches, interspersed with mixed woodland.

Distribution

Confined to Mozambique, from just west of Pemba, southwards to Monapo. Occurring in Cabo Delgado and Nampula Provinces.

Characteristic native biota

A woodland and thicket mosaic with sparse miombo (*Brachystegia spiciformis, B. allenii, B. boehmii, Julbernardia globiflora*) or miombo patches, interspersed with mixed woodland with the most prominent trees including *Adansonia digitata, Sterculia appendiculata, Ficus* spp. and scattered *Bombax rhodognaphalon.* The remaining tree component is dominated by legumes (Fabaceae) and includes, *alphabetically Acacia (adenocalyx, brevispica, burkei, gerrardii, goetzei* subsp. *goetzei* and subsp. *microphylla, hockii, latistipulata, nigrescens, nilotica* subsp. *kraussiana, polyacantha* subsp. *campylacantha, robusta* subsp. *robusta* and subsp. *usambarensis, sieberiana* var. *sieberiana), Afzelia quanzensis, Albizia (adianthifolia, amara* subsp. *amara, brevifolia, forbesii, glaberrima* var. *glabrescens, harveyi, petersiana* subsp. *petersiana, versicolor), Bolusanthus speciosa, Burkea africana, Cassia abbreviata* subsp. *beareana, A. afrofistula* var. *afrofistula, Cordyla africana, Dalbergia boehmii, D. melanoxylon, D. nitidula, Dalbergiella nyassae, Erythrina abyssinica, Erythrophleum africanum, Micklethwaitia carvalhoi, Millettia bussei, M. stuhlmannii, M. usaramensis, Parkia filicoidea* (riverine), *Philenoptera bussei, P. violacea, Pterocarpus angolensis, P. rotundifolius* subsp. *rotundifolius, Scorodophloeus torrei, Swartzia madagascariensis, Tamarindus indica, Xeroderris stuhlmannii.* Leguminous shrubs and small trees include *Baphia massaiensis* subsp. *massaiensis,* and subsp. *gomesii, Bauhinia petersiana, Dichrostachys cinerea* subsp. *forbesii* and subsp. *hirtipes, Ormocarpum kirkii, O. schliebenii,* and *Senna petersiana*. The palms *Hyphaene coriacea* are found scattered in open sandy savanna and *Raphia farinifera* in riparian areas.

Non-leguminous trees are *Berchemia discolor, Boscia angustifolia* var. *corymbosa, B. salicifolia, Brackenridgea zanguebarica, Cassipourea mossambicensis, Diplorhynchus condylocarpon, Hirtella zanzibarica, Hymenocardia acida, Hymenodictyon parvifolium, Lannea antiscorbutica, L. schweinfurthii* var. *tomentosa, Olax dissitiflora, Pseudolachnostylis maprouneifolia, Pteleopsis myrtifolia, Rinorea elliptica, Rothmannia engleriana, Schrebera trichoclada, Terminalia sericea, Tetracera boiviniana, Vitex doniana*, and *V. payos.*

Non-leguminous shrubs and small trees are numerous: *Allophylus torrei, Annona senegalensis, Buchnerodendron lasiocalyx, Cadaba kirkii, Capparis erythrocarpos, C. tomentosa, Catunaregam stenocarpa, Chazaliella abrupta, Cleistochlamys kirkii, Clerodendrum pleiosciadium, Combretum caudatisepalum, Coptosperma nigrescens, Deinbollia oblongifolia, Dielsiothamnus divaricatus, Diospyros kabuyeana, D. loureiriana, D. verrucosa, Embelia xylocarpa, Ficus nigropunctata, Grewia transzambesica, Glyphaea tomentosa, Heinsia crinita* subsp. *parviflora, H. mozambicensis, Hexalobus mossambicensis, Maerua aethiopica, M. angolensis, M. juncea* subsp. *juncea* and subsp. *crustata, Monanthotaxis obovata, Monodora grandidieri, M. junodii* var. *junodii, Mostuea brunonis, Opilia amentacea, Pavetta klotzschiana, Premna schliebenii, Psydrax moggii, Pyrostria phyllanthoidea, Ritchiea pygmaea, Rotheca myricoides*

subsp. *myricoides* var. *myricoides, R. wildii, Rourea coccinea* var. *boiviniana, R. orientalis, Thilachium africanum, Tristellateia africana, Turraea nilotica, Vismia orientalis, Ximenia caffra* var. *caffra, Xylopia gracilipes,* and *Xylotheca tettensis* var. *macrophylla.*

Smaller, less woody shrubs and herbs include several Acanthaceae *(Barleria spinulosa, Elytraria acaulis, E. marginata, Justicia flava, Neuracanthus africanus)* as well as *Aneilema pedunculosum, Commelina benghalensis, C. zambesiaca, Crotalaria virgulata* subsp. *forbesii, Eriosema parviflora Grangea zambesiaca, Indigofera rhynchocarpa* var. *ulugurensis, Pavonia leptocalyx, Polydora poskeana, Pseudovigma argentea, Rhynchosia sublobata, Solanum zanzibarensis, Tephrosia purpurea* subsp. *altissima, T. purpurea* var. *rhodesica*, and *Triumfetta pentandra.*

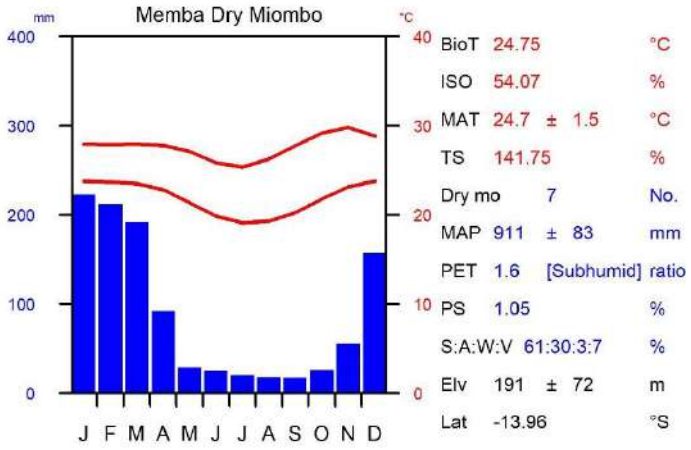
Lianes and climbers recorded are *Artabotrys brachypetalus, Asparagus petersianus, Dalbergia arbutifolia, Cryptolepis obtusa, D. bracteolata, D. fischeri, Dioscorea quartiniana, Entada chrysostachys, Keetia zanzibarica, Mezoneuron angolensis, Secamone parvifolia*, and *Tiliacora funifera.*

The vegetation typically associated with the numerous inselbergs found within this vegetation type is listed under Northern Dry Inselberg Woodland.

Abiotic environment and climate

Altitude range of 40 to 350 m asl with a mean of 191 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 60.9% while the similarly measured clay content is 24.6%. Soil pH is 6.2.

Precipitation during driest quarter is 17.8 mm.



Species of Conservation Importance

Endemic Plant Species

Acacia latistipulata [NE], *Allophylus torrei* [E], *Cuviera schliebenii* [NE], *Dorstenia zambesiaca* [E], *Heinsia mozambicensis* [E], *Micklethwaitia carvalhoi* [E], *Momordica henriquesii* [NE], *Pavetta mocambicensis* [E], *Premna schliebenii* [VU], *Scorodophloeus torrei* [E].

Threatened Plant Species

Acacia latistipulata [VU], *Allophylus torrei* [EN], *Cuviera schliebenii* [EN], *Dorstenia zambesiaca* [VU], *Micklethwaitia carvalhoi* [VU], *Momordica henriquesii* [EN], *Pavetta mocambicensis* [EN], *Scorodophloeus torrei* [EN], *Stylochaeton euryphyllus* [VU].

Biogeographic Anomalies

Diospyros kabuyeana, *Pyrostria phyllanthoidea*.

Photographic credits Nacala Velha to Memba, Nampula Province. photo: J. Burrows

RLE Assessment

Assessment Summary

This ecosystem has a restricted distribution in Northeast coastal areas of Cabo Delgado and Nampula Provinces. There is evidence of historical declines and deforestation as well as other threats leading to continuing ongoing declines. **Endangered**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 30.15% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 154 10 x 10 km grid cells and an EOO of 17661.54 km2. It has undergone historical decline, and there is evidence that deforestation & other threats are leading to continuing decline. Endangered

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.15% of the current distribution faces >90 percent degradation severity, 2.31% of the distribution faces >70 percent degradation severity, and 34.24% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

MUEDA MIXED DRY MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Miombo seco de Mueda
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Zambezian Dry Miombo

Description

Poorly known deciduous mixed woodland, forming a mosaic with the Makonde Bamboo Thicket and Mueda Dry Sand Thicket.

Distribution

From the Rovuma River west of Mueda, southwards to Mavala, Cabo Delgado Province.

Characteristic native biota

A rather under-surveyed miombo woodland composed mainly of *Brachystegia boehmii, B. spiciformis* and *Julbernardia globiflora.* Other important trees recorded are *Acacia nigrescens, A. sieberiana* var. *woodii, Adansonia digitata, Afzelia quanzensis, Albizia harveyi, Azanza garckeana, Combretum apiculatum, C. collinum, C. zeyheri, Commiphora africana, Cussonia arborea, Diospyros kirkii, Diplorhynchus condylocarpon, Dombeya shupangae, Faurea rochetiana, Lannea schimperi, Markhamia obtusifolia, M. zanzibarica, Millettia bussei, M. eetveldeana, M. stuhlmannii, Olax dissitiflora, Oxytenanthera abyssinica, Parinari curatellifolia, Pericopsis angolensis, Piliostigma thonningii, Pseudolachnostylis maprouneifolia, Pteleopsis myrtifolia, Pterocarpus angolensis, P. megalocarpus, P. rotundifolius, Schinziophyton rautanenii, Schrebera trichoclada, Sclerocarya birrea* subsp. *caffra, Sterculia appendiculata, S. quinqueloba, Strychnos cocculoides, Terminalia stenostachya,* and *Xeroderris stuhlmannii.*

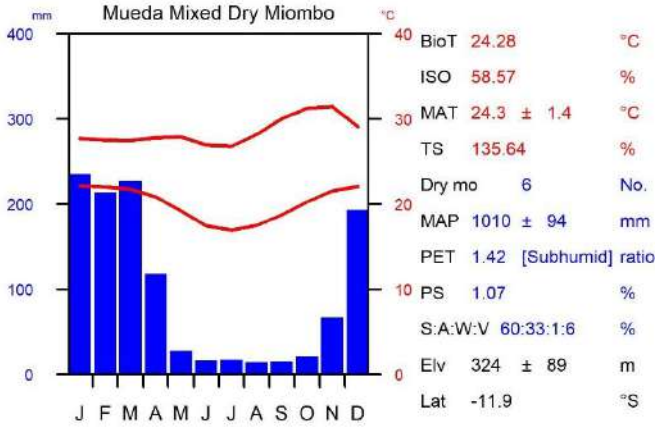
Small trees and woody shrub s include *Annona senegalensis, Bauhinia petersiana, Dalbergia melanoxylon, Elephantorrhiza goetzei, Millettia makondensis, Monodora grandidieri, Opilia amentacea, Ormocarpum kirkii*, and *Rourea orientalis.* Herbaceous species recorded are *Crotalaria misella, Desmodium procumbens, Dolichos trilobus* var. *trilobus, Psophocarpus palustris* and *Tephrosia stormsii. Crinum walteri* occurs on alluvial soils.

The riparian forest in this vegetation type is composed largely of *Albizia adianthifolia, A. glaberrima* subsp. *glabrescens, A. versicolor, Burttdavya nyasica, Cordyla africana, Dracaena mannii, Ekebergia capensis, Erythrophleum suaveolens, Faidherbia albida, Parkia filicoidea, Philenoptera violacea*, and *Sterculia appendiculata.*

Abiotic environment and climate

Altitude range of 115 to 475 m asl with a mean of 324 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 58.3% while the similarly measured clay content is 25.1%. Soil pH is 6.1.

Precipitation during driest quarter is 6.8 mm.



Species of Conservation Importance

Endemic Plant Species

Lepidagathis plantaginea [NE], *Paranecepsia alchorneifolia* [NE].

Threatened Plant Species

Lepidagathis plantaginea [EN], *Millettia makondensis* [VU], *Paranecepsia alchorneifolia* [VU].

Biogeographic Anomalies

Pterocarpus megalocarpus.

Photographic credits *top*: *Schinziophyton rautanenii* (centre) in the lower parts of this deciduous vegetation type, western base of Mueda Plateau; *bottom*: dry miombo woodland dominated by *Julbernardia globiflora*, slopes of Mueda Plateau, Cabo Delgado Province, photos: J. Burrows.

RLE Assessment

Assessment Summary

Found in the Cabo Delgado Province in Northeast Mozambique, this ecosystem has a restricted geographic distribution but there is little evidence of ongoing declines in extent. However, moderate degradation levels are present across almost half of the distribution of the ecosystem. **Vulnerable**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 2.23% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 112 10 x 10 km grid cells and an EOO of 19209.87 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.11% of the current distribution faces >90 percent degradation severity, 4.8% of the distribution faces >70 percent degradation severity, and 85.34% of the distribution faces >50 percent degradation severity. Vulnerable

Criterion E: Not evaluated

PANGUE DRY MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Miombo seco de Pangue
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Zambezian Dry Miombo

Description

Mixed deciduous miombo woodland.

Distribution

From just north of Panda, northwards through Funhalouro, to Zinave. Confined to Mozambique in the Inhambane Province.

Characteristic native biota

This unit is predominantly represented by miombo woodland, characterized by three miombo species, *Brachystegia spiciformis, Brachystegia torrei,* and *Julbernardia globiflora*. But a wide variety of other trees are additionally represented by *Acacia burkei, A. grandicornuta, A. nigrescens, A. senegal, A. welwitschii* subsp. *delagoensis, Afzelia quanzensis, Albizia anthelmintica, A. forbesii, A. petersiana, A. versicolor, Amblygonocarpus andongensis, Balanites maughamii, Berchemia discolor, Boscia albitrunca, B. foetida* subsp. *rehmanniana* and subsp. *filipes, Bourreria nemoralis, Burkea africana, Cleistanthus schlechteri, Combretum apiculatum, C. collinum, C. hereroense, C. imberbe, Ficus stuhlmannii, Glenniea africana, Hymenocardia ulmoides, Lannea stuhlmannii, Maerua angolensis, Manilkara mochisia, Margaritaria discoidea, Mundulea sericea, Newtonia hildebrandtii* var. *pubescens, Olax dissitiflora, Philenoptera violacea, Pterocarpus angolensis, Sclerocarya birrea* subsp. *caffra, Securidaca longepedunculata, Sideroxylon inerme* subsp. *diospyroides, Spirostachys africana, Strychnos madagascariensis, S. spinosa, Syzygium guineense* subsp. *guineense, Terminalia sericea, Trichilia capitata,* and *Xeroderris stuhlmannii.*

Small trees and woody shrubs: A*frocanthium racemulosum, Baphia massaiensis* subsp. *obovata, Bauhinia tomentosa, Carissa bispinosa* subsp. *bispinosa, Cassia abbreviata* subsp. *beareana, Catunaregam obovata, C. swynnertonii, Cleistochlamys kirkii, Croton aceroides, Dalbergia nitidula, Ehretia amoena, Euphorbia ambroseae* var. *spinosa, Gossypium herbaceum* var. *africanum, Grewia bicolor, Hugonia orientalis, Maerua juncea* subsp. *crustata, Maerua kirkii, Mystroxylon aethiopicum, Ozoroa obovata* var. *elliptica, Pappea capensis, Phyllanthus reticulatus,* and *Thilachium africanum.*

Soft shrubs and herbaceous species include *Abutilon austroafricanum, Adenium multiflorum, Albertisia delagoensis, Bonamia mossambicensis, Cassytha ponoensis* (parasite), *Chamaecrista mimosoides, Corbichonia decumbens, Crabbea velutina, Dicliptera elliotii, Heliotropium strigosum, Hibiscus mastersianus, H. palmatus, H. sabiensis, H. sidiformis, H. vitifolius, Hybanthus enneaspermus, Indigastrum costatum* subsp. *macrum, Indigofera fulgens, Ipomoea vernalis, Justicia flava, Pavonia leptocalyx, P. patens, Polygala marensis, P. erioptera, P. senensis, P. sphenoptera, Salacia rehmannii, Sansevieria pearsonii,* and *Solanum catombelense*. Climbers and lianes recorded are *Ancylobothrys petersiana, Aristolochia petersiana, Artabotrys brachypetalus, Loeseneriella africana, L. crenata, Sarcostemma viminale*, and *Strophanthus petersianus.*

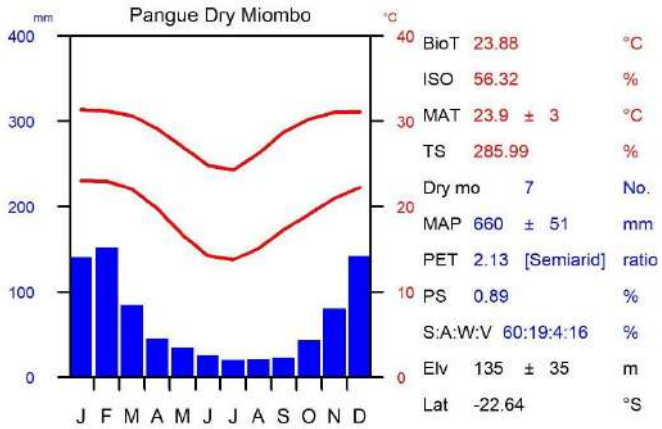
However, this unit is also very much a mosaic of several different subtypes.

1) *Brachystegia torrei*–dominated forest (see also Save Sand Forest), occurs in places on deep sandy soils and is associated with *Lannea antiscorbutica, Guibourtia conjugata, and Xylia torreana,* as well as *Coptosperma littorale*, *C. nigrescens, C. zygoon, Heinsia crinita, Hyperacanthus microphyllus, Landolphia kirkii, Maerua brunnescens* subsp. *scandens, Monodora junodii, Paropsia braunii, Pavetta gracillima, Psydrax livida, Salacia leptoclada, Strychnos panganensis, Suregada zanzibarensis, Synaptolepis oliveriana, Uvaria gracilipes*, and *Vepris carringtoniana.*
2) Tree savanna with *Terminalia sericea, Albizia versicolor, Combretum* spp., *Garcinia livingstonei*, and *Strychnos* spp.
3) A shrub savanna with, among others, *Acacia goetzei, A. nigrescens, Adansonia digitata, Albizia harveyi, Combretum hereroense, C. imberbe, C. mossambicense, Commiphora africana, Dalbergia melanoxylon, Euclea divinorum, E. schimperi, E. undulata, Euphorbia ingens, Sterculia rogersii,* and an abundance of *Gossypium herbaceum* var *africanum* and *Maerua edulis* in grey, clayey, more compact soils.
4) Small pockets of woodland dominated by *Colophospermum mopane* (see Southern Mopane Woodland).
5) Numerous stands of *Androstachys johnsonii* forest (see Ironwood Dry Forest).

Abiotic environment and climate

Altitude range of 60 to 205 m asl with a mean of 135 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 65.7% while the similarly measured clay content is 20.2%. Soil pH is 6.2.

Precipitation during driest quarter is 29.3 mm.



Species of Conservation Importance

Endemic Plant Species

Vepris myrei [NE].

Threatened Plant Species

Guibourtia schliebenii [VU], *Vepris myrei* [EN].

Photographic credits *left*: *Brachystegia spiciformis-Julbernardia* miombo woodland, S of Funalhuro, Inhambane Province; *right*: *Julbernardia* miombo woodland, Inhambane Province. photos: J. Burrows.

RLE Assessment

Assessment Summary	Assessment Information
This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**	**Criterion A:** Expansion of urban areas, agriculture & deforestation has caused a 11.77% decline since 1750. Least Concern **Criterion B:** This ecosystem has an AOO of 353 10 x 10 km grid cells and an EOO of 37718.27 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern **Criterion C:** Not evaluated **Criterion D:** Degradation assessment shows that 0.05% of the current distribution faces >90 percent degradation severity, 0.68% of the distribution faces >70 percent degradation severity, and 16.35% of the distribution faces >50 percent degradation severity. Least Concern **Criterion E:** Not evaluated

SAVE COASTAL MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Miombo costeiro do Save
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Zambezian Dry Miombo

Description

Tall closed woodland 10 to 15 m tall. On ridge crests or slightly elevated sandy areas in a gently undulating landscape. Tree species with an estimated 20% cover; grass sward with 70% cover.

Distribution

Confined to a small area north of the Save River mouth, towards the Buzi River, within 75 km of the coast, benefiting from the moist air coming off the Indian Ocean; Sofala Province.

Characteristic native biota

Trees include *Amblygonocarpus andongensis, Brachystegia torrei, Cleistochlamys kirkii, Crossopteryx febrifuga, Hymenocardia ulmoides, Julbernardia globiflora, Lannea schweinfurthii, Millettia stuhlmannii, Piliostigma thonningii, Pseudolachnostylis maprouneifolia, Pteleopsis myrtifolia, Sclerocarya birrea* subsp. *caffra, Strychnos madagascariensis, Terminalia sericea, Vitex payos* var. *glabrescens,* and *Xeroderris stuhlmannii,*

Small trees and shrubs noted are *Annona senegalensis, Coptosperma supra-axillare, Diospyros loureiriana, Ehretia amoena, Grewia caffra, G. inaequilatera, Gymnosporia senegalensis, Hyphaene coriacea, Lippia javanica, Ozoroa obovata, Tricalysia delagoensis* and *Turraea nilotica.*

Climbers/scramblers recorded are *Basananthe triloba, Flagellaria guineensis, Grewia sulcata, Jasminum fluminense,* and *Rhoicissus revoilii.*

Dominant grasses are *Eragrostis* sp., *Panicum maximum* and *Urochloa mosambicensis.* Common species in the herbaceous layer are *Dicerocaryum senecioides, Waltheria indica* and *Commelina* spp.

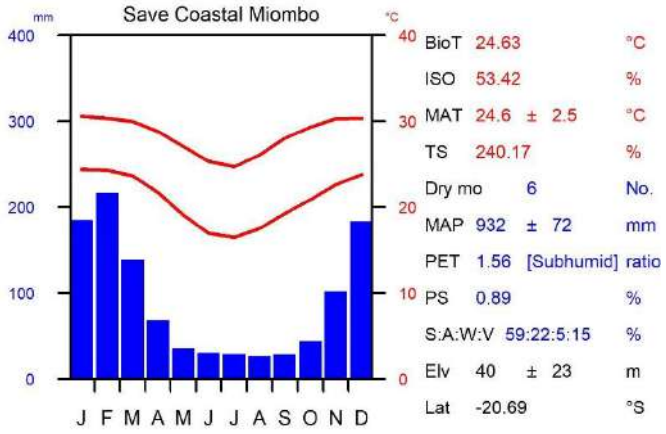
Isolated patches of well-developed forest (*Diospyros mespiliformis*) or thicket develop on termite mounds.

Abiotic environment and climate

Eluvial deposits comprised of clayey sand formed during the Pleistocene owing to erosion processes acting on the sandstone units. This vegetation type is associated with eluvial floodplain mud deposits. Soils a dark brown sandy clay loam.

Altitude range of 10 to 100 m asl with a mean of 40 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 63.6% while the similarly measured clay content is 21.9%. Soil pH is 6.3.

Precipitation during driest quarter is 44.4 mm.



Species of Conservation Importance: none recorded.

Photographic credits *Left & right*: 15 km north of Save River near the coast, Sofala Province. photos: A. de Castro.

RLE Assessment

Assessment Summary

This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 2.84% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 36 10 x 10 km grid cells and an EOO of 3915.12 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0% of the current distribution faces >90 percent degradation severity, 0.22% of the distribution faces >70 percent degradation severity, and 12.48% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

TETE MIXED DRY MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Mata seca indiferenciada de Tete
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Zambezian Dry Miombo

Description

Dry deciduous miombo woodland situated between the *Brachystegia boehmii*-dominated woodlands above and the *Colophospermum mopane* woodlands below. Typically between 400 and 700 m.

Distribution

Along the base of the Maravia escarpment north of Cahora Bassa (Tete Province).

Characteristic native biota

The trees are dominated by *Julbernardia globiflora* but also commonly occurring with *Acacia amythethophylla, A. nigrescens, A. goetzei* subsp. *goetzei, A. gerrardii, A. hockii, A. nilotica* subsp. *kraussiana, A. polyacantha* subsp. *campylacantha, Albizia amara* subsp. *sericocephala, A. tanganyikensis, Diplorhynchus condylocarpon, Brachystegia boehmii, Burkea africana, Colophospermum mopane, Combretum adenogonium, Dalbergia melanoxylon, Diospyros kirkii, Ekebergia benguelensis, Kirkia acuminata, Newtonia hildebrandtii, Oxytenanthera abyssinica, Peltophorum africanum, Piliostigma thonningii, Pseudolachnostylis maprouneifolia, Pterocarpus brenanii, Pterocarpus chrysothrix* (as *P. tinctorius); Schinziophyton rautanenii,* and *Terminalia sericea.* On higher ground *Brachystegia allenii, B boehmii, B. glaucescens* and *B. spiciformis* may become dominant, while on lower areas *Brachystegia allenii* and *Sterculia quinqueloba* are more abundant.

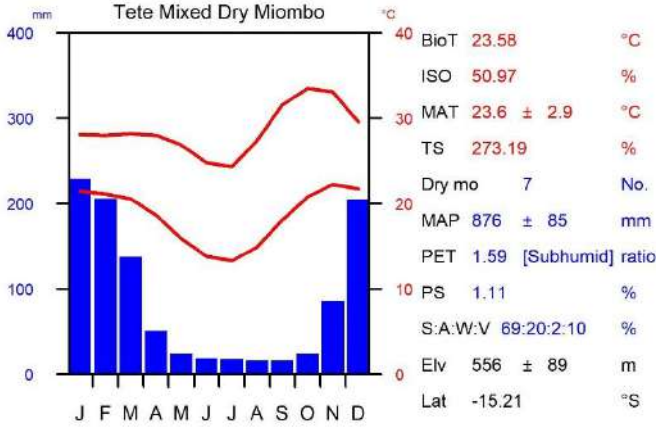
Small trees and shrub include *Catunaregam pentandra, Combretum obovatum, Dalbergiella nyassae, Dalbergia nitidula, Diospyros loureiriana, Euphorbia griseola* subsp. *maschonica, Ficus nigropunctata* and *Hugonia orientalis.*

Ground flora noted: *Asparagus shirensis, Lablab purpureus, Ochna leptoclada, O. macrocalyx, Vicia paucifolia,* and *Xerophyta suaveolens* var. *suaveolens*.

Abiotic environment and climate

Altitude range of 400 to 750 m asl with a mean of 556 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 64.4% while the similarly measured clay content is 21.3%. Soil pH is 6.1.

Precipitation during driest quarter is 9.9 mm.



Species of Conservation Importance: none recorded.

Photographic credits Between Cazula and Furancungo, Tete Province. photo: J. Burrows

RLE Assessment

Assessment Summary

This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 7.76% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 301 10 x 10 km grid cells and an EOO of 47140.48 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.03% of the current distribution faces >90 percent degradation severity, 1.4% of the distribution faces >70 percent degradation severity, and 19.48% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

VILANCULOS COASTAL MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Miombo costeiro de Vilanculos
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Zambezian Dry Miombo

Description

Deciduous, and often low and open miombo woodland with occasional freshwater depressions.

Distribution

Confined to coastal region of Mozambique, from south of Save River, southwards to just east of Mavanza; Inhambane Province.

Characteristic native biota

Apart from the sometimes dominant miombo tree species of *Brachystegia spiciformis, B. torrei*, and *Julbernardia globiflora*, other trees recorded are *Acacia nigrescens, A. nilotica* subsp. *kraussiana, A. robusta* var. *clavigera, Adansonia digitata, Afzelia quanzensis, Albizia adianthifolia, A. forbesii, A. versicolor, Bolusanthus speciosus, Cassia abbreviata* subsp. *beareana, Cleistochlamys kirkii, Combretum molle, Commiphora schlechteri, Cordia caffra* var. *caffra, Cordyla africana, Craibia zimmermannii, Crossopteryx febrifuga, Diospyros inhacaensis, D. rotundifolia, Dolichandrone alba, Drypetes mossambicensis, Elaeodendron fruticosum, Ficus lingua* subsp. *depauperata, Garcinia livingstonei, Hymenocardia ulmoides, Hyphaene coriacea, Lannea schweinfurthii, Maerua angolensis, Manilkara discolor, M. mochisia, Markhamia zanzibarica, Millettia stuhlmannii, Mimusops obtusifolia, Olax dissitiflora, Ozoroa obovata, Pappea capensis, Parinari curatellifolia, Phoenix reclinata, Piliostigma thonningii, Pseudolachnostylis maprouneifolia, Pteleopsis myrtifolia, , Sclerocarya birrea subsp. caffra, Sideroxylon inerme* subsp. *diospyroides, Spirostachys africana, Strychnos madagascariensis, S. potatorum, S. spinosa, Tamarindus indica, Terminalia sericea, Trichilia emetica, Uapaca nitida, Xylia mendoncae,* and *Ziziphus mauritiana.*

Small trees and woody shrubs include *Annona senegalensis, Artabotrys brachypetalus, Baphia massaiensis* subsp. *ovata, Brackenridgea zanguebarica, Bridelia cathartica* subsp. *melanthioides, Chamaecrista paralias, Carissa praetermissa, Cassia afrofistula var. afrofistula, Catunaregam obovata, C. taylorii, Coffea racemosa, Croton inhambanensis, Cussonia arenicola, Deinbollia oblongifolia, Dichapetalum deflexum, Dichrostachys cinerea* subsp. *nyassana, Erythrococca menyharthii, Erythroxylum emarginatum, Euclea divinorum, E. natalensis, Eugenia capensis* subsp. *capensis, E. mossambicensis, Excoecaria bussei, Flacourtia indica, Grewia hornbyi, G. sulcata, Heinsia crinita* subsp. *parviflora, Gymnanthemum coloratum, Lagynias monteiroi, Maclura africana, Maerua triphylla* var. *pubescens, Maprounea africana, Monodora junodii* var. *junodii, Mystroxylon aethiopicum, Ochna barbosae, Opilia amentacea, Ozoroa obovata* var. *elliptica, Pavetta uniflora, Phyllanthus mendoncae, P. reticulatus, Psydrax moggii, Searsia natalensis, Sphaerocoryne gracilis* subsp. *gracile, Strychnos panganensis, Synaptolepis oliveriana, Turraea nilotica, T. wakefieldii, Vitex ferruginea, V. payos* var. *glabrescens, Warneckea zanzibarica,* and *Xylotheca kraussiana.*

Climbers recorded are *Acacia kraussiana, Ancylobotrys petersiana, Capparis brassii, C. sepiaria* var. *subglabra, Cissus quadrangularis, C. integrifolia, Cissampelos mucronata, Combretum pisoniiflorum, Dichapetalum madagascariensis, Entada wahlbergii, Loeseneriella crenata, Mikania natalensis, Opilia amentacea, Paederia bojeriana* subsp. *foetens, Pergularia daemia* subsp. *barbata, Rhoicissus revoilii, Salacia madagascariensis, Sarcostemma viminale, Smilax anceps,* and *Tiliacora funifera.*

Soft shrubs and herbaceous species include *Abutilon grandiflorum, Alectra sessiliflora, Asparagus petersianus, A. setaceus, Barleria delagoensis, B. repens, Chamaecrista biensis, Cleome stricta, Commelina erecta, Corchorus junodii, Crotalaria monteiroi, Ecbolium hastatum, Enicostema axillare, Eriosema psoraleoides, Glinus oppositifolius, Helichrysum argyrosphaerum, H. kraussii, Hibiscus caesius,* var. *caesius, H. cannabinus, Justicia capensis, Kleinia galpinii, K. fulgens, Neurotheca congolana, Pedalium murex, Polygala capillaris, Talinum caffrum, Vanilla roscheri,* and *Waltheria indica,*

Grasses recorded are *Andropogon schirensis, Brachiaria arrecta, Chloris pycnothrix, Chrysopogon serrulatus, Digitaria milanjiana, D. perrottetii, D. rukwae, Eragrostis chapelieri, E. inamoena, Hyperthelia dissoluta, Ischaemum afrum, Leersia hexandra, Oryza longistaminata, Panicum maximum, Pogonarthria squarrosa, Schizachyrium lopollense, S. sanguineum, Setaria incrassata, Tricholaena monachne*, and *Trichopteryx dregeana.*

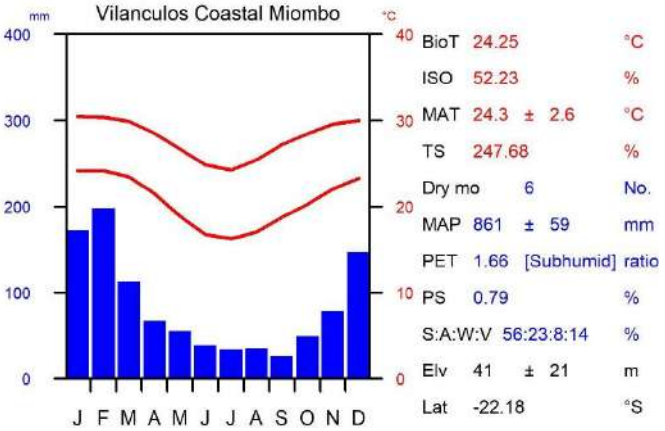
There are numerous pans and wetlands of various sizes within this region, with some of the plants recorded from this habitat being *Ammannia fernandesiana, Helichrysopsis septentrionale, Lindsaea ensifolia Lycopodiella caroliniana, Monochoria africana, Nymphaea nouchali* var. *caerulea, Nymphoides thunbergiana, Pentodon pentandrus* var. *minor, Utricularia firmula,* and *U. scandens,*

Sedges often associated with wetlands are *Cyperus angolensis, C. obtusiflorus, Eleocharis variegata, Pycreus nitidus Rhynchospora brownii, R. rubra* subsp. *africana, Scleria catophylla, Schoenoplectus scirpoides, Schoenus nigricans,* and *Scleria catophylla*.

Abiotic environment and climate

Altitude range of 5 to 120 m asl with a mean of 41 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 76.2% while the similarly measured clay content is 14.3%. Soil pH is 6.1.

Precipitation during driest quarter is 58.2 mm.



Species of Conservation Importance

Endemic Plant Species

Bauhinia burrowsii [E], *Carissa praetermissa* [E], *Croton inhambanensis* [E], *Ecbolium hastatum* [E], *Elaeodendron fruticosum* [E], *Ozoroa gomesiana* [E], *Triaspis suffulta* [E], *Xylia mendoncae* [E].

Threatened Plant Species

Bauhinia burrowsii [EN], *Croton inhambanensis* [EN], *Ecbolium hastatum* [EN], *Ozoroa gomesiana* [VU], *Xylia mendoncae* [VU].

Photographic credits *Left*: N. of Vilanculos, Inhambane Province. photo: M. Stalmans; *right*: near Inhassoro, Inhambane Province. photo: M. Stalmans.

RLE Assessment

Assessment Summary	Assessment Information
This ecosystem has declined by more than 50% since 1750 due to expansion of agriculture, urban areas and deforestation. **Vulnerable**	**Criterion A:** Expansion of urban areas, agriculture & deforestation has caused a 51.85% decline since 1750. Vulnerable **Criterion B:** This ecosystem has an AOO of 65 10 x 10 km grid cells and an EOO of 70095.02 km2. Least Concern **Criterion C:** Not evaluated **Criterion D:** Degradation assessment shows that 0.38% of the current distribution faces >90 percent degradation severity, 6.73% of the distribution faces >70 percent degradation severity, and 59.43% of the distribution faces >50 percent degradation severity. Least Concern **Criterion E:** Not evaluated

GURO DRY WOODLAND

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Mata seca de Guro

Biome Savannas and grasslands (T4)

Functional group Pyric tussock savannas (T4.2)

Regional Ecosystem Zambezian Savanna

Description

Mixed deciduous woodland seldom dominated by any one species or group of species, except for pockets of *Colophospermum mopane* woodland.

Distribution

Extending from Zimbabwe into Mozambique via Nyamapanda, then up to Mufa-Caconde and southwards towards Maringue. Occurring in Manica, Sofala, and Tete Provinces.

Characteristic native biota

The recorded trees are *Acacia ataxacantha, A. gerrardii, A. latistipulata, A. nigrescens, A. nilotica* subsp. *kraussiana, A. polyacantha* subsp. *campylacantha, A. robusta* subsp. *usambarensis, A. schweinfurthii, A. sieberiana, A. tortilis* subsp. *spirocarpa, A. welwitschii* subsp. *delagoensis, Adansonia digitata, Albizia anthelmintica, A. brevifolia, A. harveyi, A. tanganyicensis, A, versicolor, A. zimmermannii, Boscia angustifolia* var. *corymbosa, B. mossambicensis, B. salicifolia, Brachystegia spiciformis, Cassia abbreviata* subsp. *abbreviata, Cleistochlamys kirkii, Combretum adenogonium, C. apiculatum, C. collinum, C. elaeagnoides, C. goetzei, C. hereroense, C. molle, Commiphora africana, C. edulis, C. madagascariensis, Crossopteryx febrifuga, Diospyros loureiriana* subsp. *loureiriana, D. mespiliformis, D. quiloensis, D. senensis, D. squarrosa, Erythrina livingstoniana, Guibourtia conjugata, Holarrhena pubescens, Julbernardia globiflora, Lannea discolor, L. schweinfurthii, Maerua angolensis, Markhamia zanzibarica, Philenoptera bussei, Pterocarpus angolensis, P. brenanii, P. lucens* subsp *antunesii, P. rotundifolius* subsp. *martinii, Sclerocarya birrea* subsp. *caffra, Strychnos madagascariensis, Terminalia sambesiaca, T. sericea, T. stenostachya, Trichilia capitata, Xeroderris stuhlmannii*, and *Xylia torreana.*

Numerous rocky hills are scattered throughout the area and are home to, among others, *Adansonia digitata, Afrocanthium pseudorandii, Afzelia quanzensis, Brachystegia glaucescens, B. torrei, Burkea africana, Commiphora mollis, Cordia grandicalyx, Cussonia spicata, Diplorhynchus condylocarpon, Ficus abutilifolia, F. glumosa, F. tettensis, Gyrocarpus americanus, Karomia tettensis, Kirkia acuminata, Lecaniodiscus fraxinifolius, Millettia stuhlmannii, Monanthotaxis obovata, Monodora junodii* var. *junodii, Pseudolachnostylis maprouneifolia, Steganotaenia araliacea, Sterculia africana, S. quinqueloba, Stereospermum kunthianum, Strychnos decussata,* and *Vitex petersiana.*

Small trees and woody shrubs are *Bauhinia tomentosa, Cadaba kirkii, Canthium glaucum* subsp. *frangula, Capparis erythrocarpos* var. *rosea, C. tomentosa, Dalbergiella nyassae, Deinbollia xanthocarpa, Dalbergia melanoxylon, Dichrostachys cinerea* var. *plurijuga, Dirichletia pubescens, Elephantorrhiza goetzei, Empogona allenii, Grewia bicolor, G. flavescens* var. *olukondae, G. inaequilatera, G. monticola, G. sulcata, Gymnanthemum coloratum* subsp. *coloratum, Maerua juncea* subsp. *juncea, Monodora stenosepala, Mundulea sericea, Premna senensis, Senna alata, S. singueana, Sesbania leptocarpa* var. *minimiflora, Thilachium africanum,* and *Ximenia americana* subsp. *microphylla.*

Soft shrubs and herbaceous species are *Alchornea laxiflora, Asparagus nelsii, Commelina forskaolii, Crinum stuhlmannii* subsp. *delagoense, Crotalaria hyssopifolia, C. laburnifolia* subsp. *laburnifolia, C. podocarpa, C. virgulata* subsp. *virgulata, Cyphostemma congestum, Hermannia glanduligera, H. kirkii, H. modesta, Hibiscus allenii, H. caesius, Indigofera trita* var. *scabra, Ipomoea simonsiana, Jasminum fluminense, Marsdenia macrantha, Melhania acuminata* var. *acuminata, M. forbesii, Sansevieria pedicellata, Sphaeranthus angolensis, Tacazzea apiculata, and Tephrosia villosa* subsp. *ehrenbergiana.*

Climbers noted are *Artabotrys brachypetalus, Capparis sepiaria* var. *subglabra, Dalbergia arbutifolia, Entada chrysostachys, Fockea multiflora, Loeseneriella africana* var. *richardiana, Stomatostemma monteiroae, Strophanthus kombe,* and *S. petersianus.*

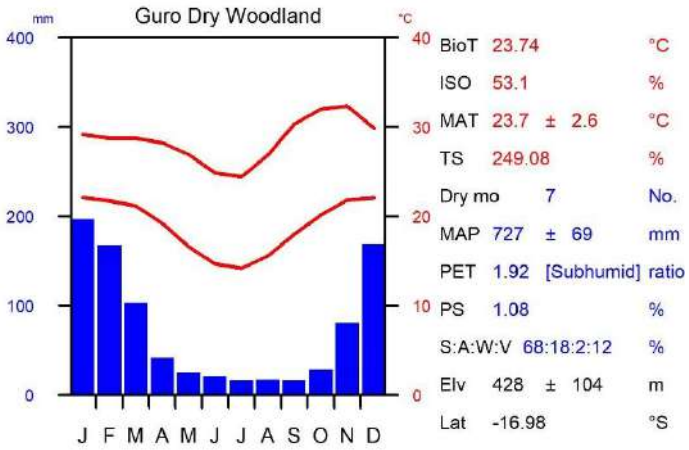
The only grasses recorded from this type are *Enteropogon macrostachyus, Leptocarydion vulpiastrum, Schmidtia pappophoroides,* and *Tricholaena monachne.*

Riparian vegetation includes *Acacia galpinii, A. robusta* subsp. *clavigera, Berchemia discolor, Capparis tomentosa, Combretum microphyllum, C. mossambicense, Cordyla africana, Croton megalobotrys, Dalbergia fischeri, Diospyros mespiliformis, Faidherbia albida, Khaya anthotheca, Philenoptera violacea, Phyllanthus reticulatus, Sterculia appendiculata, Tamarindus indica, Trichilia emetica, Vitex schliebenii,* and *Xanthocercis zambeziaca.*

Abiotic environment and climate

Altitude range of 175 to 680 m asl with a mean of 428 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 66.3% while the similarly measured clay content is 19.4%. Soil pH is 6.2.

Precipitation during driest quarter is 11.2 mm.



Species of Conservation Importance

Endemic Plant Species

Acacia latistipulata [NE].

Biogeographic Anomalies

Afrocanthium pseudorandii.

Photographic credits *top*: between Guro and Mungari, Manica Province. photo: J. Burrows; *bottom*: Luenha River, a tributary of the Zambezi River. photo: J. Burrows.

RLE Assessment

Assessment Summary	Assessment Information
This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**	**Criterion A:** Expansion of urban areas, agriculture & deforestation has caused a 27.25% decline since 1750. Least Concern **Criterion B:** This ecosystem has an AOO of 145 10 x 10 km grid cells and an EOO of 18148.01 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern **Criterion C:** Not evaluated **Criterion D:** Degradation assessment shows that 0.08% of the current distribution faces >90 percent degradation severity, 4.7% of the distribution faces >70 percent degradation severity, and 36.29% of the distribution faces >50 percent degradation severity. Least Concern **Criterion E:** Not evaluated

LUPATA PLATEAU DRY WOODLAND

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Mata seca do planalto de Lupata

Biome Savannas and grasslands (T4)

Functional group Pyric tussock savannas (T4.2)

Regional Ecosystem Zambezian Savanna

Description

Seasonally dry deciduous woodland on alkaline lavas.

Distribution

Confined to the mountains of Lupata Gorge on the Zambezi River in Manica and Tete provinces.

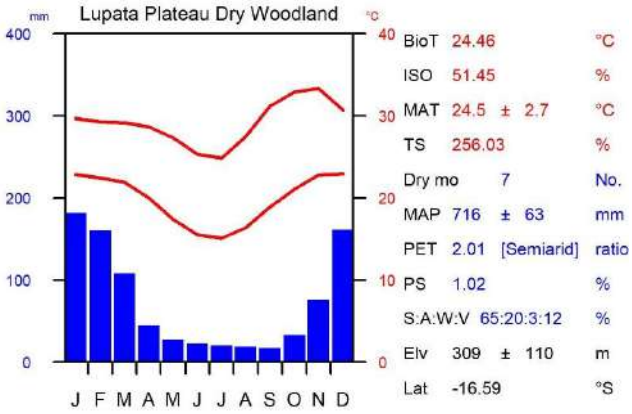
Characteristic native biota

This vegetation unit is significant for enclosing perhaps the only two known localities of *Bussea xylocarpa*; the Lupata Gorge is also the type locality of *Cladostemon kirkii*. Largely composed of seasonally dry deciduous woodland with a significant area of unexplored thicket on the plateau summit (visible on Google Earth). A poorly known vegetation type, with the following recorded from this unit. Trees: *Acacia* spp. (*adenocalyx, schweinfurthii, sieberiana* var. *woodii, welwitschii* subsp. *delagoensis*), *Brachystegia torrei, Bussea xylocarpa, Cladostemon kirkii, Dombeya kirkii, Erythrophleum africanum, Guibourtia conjugata, Trichilia capitata* and *Xylia torreana*. Shrubs and forbs: *Asparagus* cf. *racemosus, Canthium glaucum* subsp. *frangula, Crotalaria polysperma, Dombeya kirkii, Indigofera lupatana, Mimosa mossambicensis, Rhynchosia sublobata, R. minima, Solanum macrocarpon*, and *Tricalysia jasminiflora.*

Abiotic environment and climate

Altitude range of 105 to 605 m asl with a mean of 309 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 55.5% while the similarly measured clay content is 24.9%. Soil pH is 6.3.

Precipitation during driest quarter is 14.7 mm.



Species of Conservation Importance

Endemic Plant Species

Bussea xylocarpa [E*].

Threatened Plant Species

Bussea xylocarpa: although unassessed, should be regarded as Endangered.

Biogeographic Anomalies

Bussea xylocarpa, Mimosa mossambicensis.

Photographic credits Southern bank and hillside, south of Zambezi River flowing through Lupata Gorge. photo: M. Lotter.

RLE Assessment

Assessment Summary	Assessment Information
This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**	**Criterion A:** Expansion of urban areas, agriculture & deforestation has caused a 9.39% decline since 1750. Least Concern **Criterion B:** This ecosystem has an AOO of 33 10 x 10 km grid cells and an EOO of 3015.47 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern **Criterion C:** Not evaluated **Criterion D:** Degradation assessment shows that 0% of the current distribution faces >90 percent degradation severity, 0.2% of the distribution faces >70 percent degradation severity, and 12.54% of the distribution faces >50 percent degradation severity. Least Concern **Criterion E:** Not evaluated

MADANDA SANDSTONE DRY WOODLAND

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Mata seca em arenito de Madanda

Biome Savannas and grasslands (T4)

Functional group Pyric tussock savannas (T4.2)

Regional Ecosystem Zambezian Savanna

Description

Mixed woodland.

Distribution

Limited to an area just north of the Buzi River, southwards through Guengere to just north of Chitobe; in Manica and Sofala Provinces.

Characteristic native biota

The trees are dominated by *Acacia erubescens, A. gerrardii, A. nigrescens, A. nilotica* subsp. *kraussiana, Albizia anthelmintica, A. harveyi, Bauhinia petersiana, Bolusanthus speciosus, Burkea africana, Cassia abbreviata, Colophospermum mopane, Combretum* spp. (*C. imberbe, C. adenogonium, C. hereroense, C. microphyllum*), *Dalbergia melanoxylon, Entada abyssinica, Julbernardia globiflora, Peltophorum africanum, Philenoptera violacea, Piliostigma thonningii, Pterocarpus brenanii, P. rotundifolius* subsp. *polyanthus, Terminalia mollis, T. sericea, T. stenostachya,* and *Xeroderris stuhlmannii.*

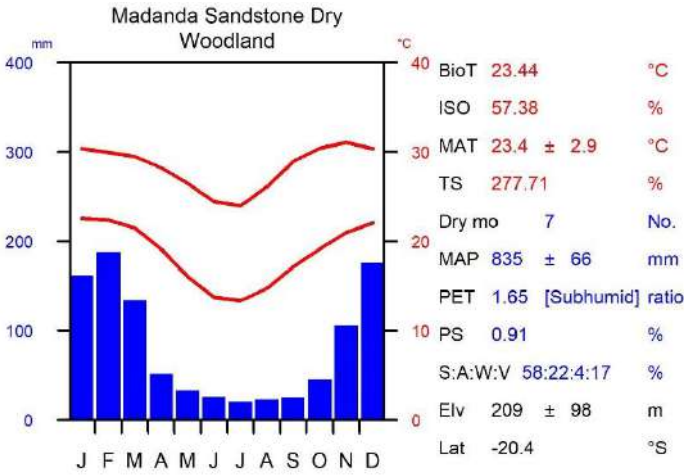
Small trees and shrubs include *Cadaba termitaria, Catunaregam swynnertonii, Gymnosporia senegalensis, Maerua juncea* subsp. *crustata, Mundulea sericea, Ochna angustata,* and *Solanum campylacanthum,*

Grasses recorded include *Alloteropsis semialata, Andropogon* spp., *Hyperthelia dissoluta, Panicum maximum, Perotis patens,* and *Themeda triandra.*

Abiotic environment and climate

Altitude range of 40 to 400 m asl with a mean of 209 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 62.7% while the similarly measured clay content is 22.1%. Soil pH is 6.2.

Precipitation during driest quarter is 36.6 mm.



Species of Conservation Importance: none recorded.

RLE Assessment

Assessment Summary

This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 14.92% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 70 10 x 10 km grid cells and an EOO of 8759.53 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.04% of the current distribution faces >90 percent degradation severity, 1.46% of the distribution faces >70 percent degradation severity, and 30.23% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

MARINGUE SANDSTONE DRY WOODLAND

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Mata seca em arenito de Maringue

Biome Savannas and grasslands (T4)

Functional group Pyric tussock savannas (T4.2)

Regional Ecosystem Zambezian Savanna

Description

Deciduous mixed woodland with some miombo elements.

Distribution

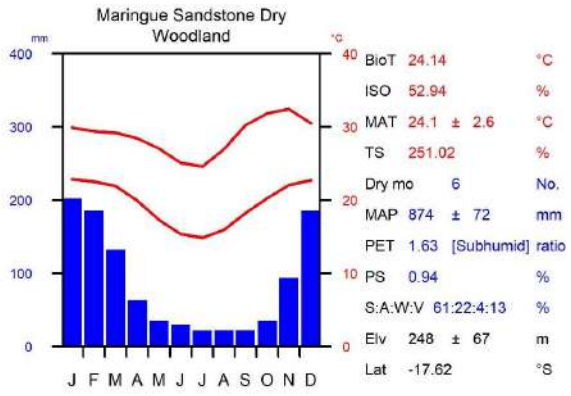
Along sandstones from Lupata down to Vanduzi; in Manica and Sofala Provinces. Limited to Mozambique.

Characteristic native biota

Characteristic trees are *Acacia nigrescens, A. nilotica* subsp. *kraussiana, Adansonia digitata, Afzelia quanzensis, Albizia harveyi, Dalbergia boehmii, D. melanoxylon, Diplorhynchus condylocarpon, Pterocarpus brenanii,* and *Sterculia appendiculata.* Some dry forest remnants in the valleys are composed of *Albizia versicolor, A. glaberrima* subsp. *glabrescens, Cordyla africana, Kigelia africana, Millettia stuhlmannii, Philenoptera violacea*, with elements such as *Craibia zimmermannii* and *Coffea racemosa* as understorey.

On the flat low-lying heavier soils occur *Acacia kirkii, A. nilotica* subsp. *kraussiana, A. polyacantha* subsp. *campylacantha, A. tortilis* subsp. *spirocarpa, A. xanthophloea, Combretum adenogonium, C. imberbe, C. microphyllum* and *Spirostachys africana*. On sandier soils are found *Brachystegia spiciformis, Burkea africana, Diospyros kirkii, Julbernardia globiflora, Lannea schimperi, Phyllanthus pinnata, Piliostigma thonningii, Pseudolachnostylis maprouneifolia, Sclerocarya birrea* subsp. *caffra, Terminalia sericea,* and *Vitex ferruginea.*

Abiotic environment and climate



Altitude range of 120 to 400 m asl with a mean of 248 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 58.8% while the similarly measured clay content is 24.1%. Soil pH is 6.3.

Precipitation during driest quarter is 38 mm.

Species of Conservation Importance: none recorded.

Photographic credit tall closed miombo–*Acacia nigrescens* woodland, N.E. of Mt Gorongosa on EN1, Sofala Province. photo: M. Stalmans.

RLE Assessment

Assessment Summary

This ecosystem has a restricted distribution in the central Manica and Sofala Provinces. There is evidence of historical declines and deforestation as well as other threats leading to continuing ongoing declines. **Endangered**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 32.59% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 54 10 x 10 km grid cells and an EOO of 6025.45 km2. It has undergone historical decline, and there is evidence that deforestation & other threats are leading to continuing decline. Endangered

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0% of the current distribution faces >90 percent degradation severity, 1.97% of the distribution faces >70 percent degradation severity, and 39.43% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

AMARAMBA MOIST MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Miombo húmido de Amaramba
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Zambezian Wet Miombo

Description

Moist deciduous to semi-deciduous miombo woodland.

Distribution

In Mozambique and Malawi, from just north of Milange, northwards to Metarica and Mitande. Occurring in Niassa and Zambezia Provinces.

Characteristic native biota

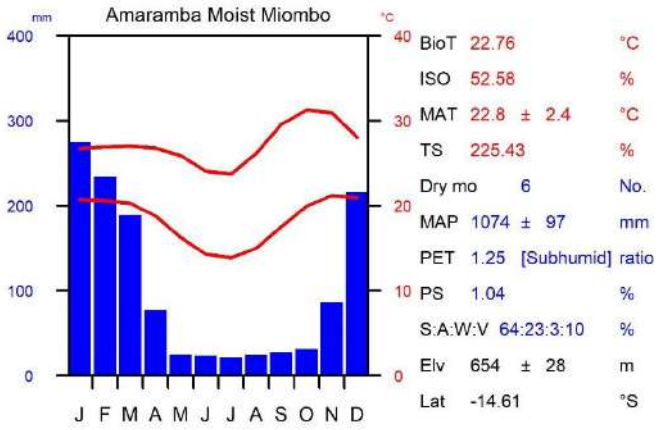
A moist miombo woodland typified by *Julbernardia globiflora, Brachystegia spiciformis, B. boehmii, B. manga, B. utilis,* with *B. bussei* restricted to rocky hills. Also with trees such as *Acacia amythethophylla, A. gerrardii, A. sieberiana* var. *woodii, Albizia amara* subsp. *sericocephala, Boscia salicifolia, Burkea africana, Combretum apiculatum, C. hereroense, C. molle, Crossopteryx febrifuga, Dalbergia boehmii, D. nitidula, Dalbergiella nyassae, Diplorhynchus condylocarpon, Diospyros kirkii, Entada abyssinica, Lannea discolor, Millettia usaramensis* subsp. *australis, Monotes engleri, Oxytenanthera abyssinica, Parinari curatellifolia, Pericopsis angolensis, Pseudolachnostylis maprouneifolia, Pterocarpus angolensis, Strychnos madagascariensis, S. spinosa, Swartzia madagascariensis, Syzygium guineense* subsp. *guineense, Terminalia sericea, T. stenostachya, Uapaca kirkiana,* and *U. nitida*

Lower-lying areas such as valley floors on alluvium and depressions with heavier soils commonly support Acacia species including *A. burkei, A. nilotica* subsp. *kraussiana, A. pilispina, A. polyacantha* subsp. *campylacantha,* and *A. xanthophloea*, *Albizia harveyi, Combretum adenogonium, Gymnosporia senegalensis, Lannea schimperi,* and *Piliostigma thonningii.*

Small trees and woody shrubs are *Droogmansia pteropus, Artabotrys brachypetalus, Bauhinia galpinii, B. petersiana, Combretum psidioides* subsp. *psidioides, Dichrostachys cinerea* subsp. *nyassana, Elephantorrhiza goetzei, Embelia xylocarpa, Gymnanthemum coloratum* subsp. *coloratum, Hymenocardia acida, Margaritaria discoidea* var. *triplosphaera, Monanthotaxis buchananii, M. obovata, Ormocarpum kirkii, Protea angolensis* var. *divaricata, Psychotria eminiana* subsp. *eminiana, Rourea orientalis, Vangueria infausta* and *Vitex mombassae.*

Herbaceous species include *Aerva leucura, Aeschynomene abyssinica, Blepharis affinis, Chamaecrista mimosoides, C. polytricha* var. *polytricha, Crotalaria calycina, C. glaucifolia, C. natalitia, C. nigricans, C. recta, C. reptans, Faroa salutaris, Kalanchoe lanceolata, Monechma ciliatum, Phyllanthus leucanthus, Solanum richardii,* and *Vigna reticulata.* The few grasses recorded are *Pogonarthria squarrosa, Chloris gayana, Cynodon dactylon, Eriochloa maclounii, Hyparrhenia filipendula, Microchloa caffra, Pennisetum purpureum, Rottboellia cochinchinensis*, and *Zonotriche inamoena.*

Riparian forest (part of the Lurio Riparian Forest unit): *Albizia glaberrima* subsp. *glabrescens, A. versicolor, Antidesma venosum, Diospyros mespiliformis, Faurea delevoyi, Garcinia livingstonei, Maytenus undata, Parkia filicoidea, Philenoptera violacea, Prunus africana, Pteleopsis myrtifolia, Synsepalum brevipes, Syzygium cordatum,* and *Ziziphus abyssinica.* Lianes include *Dalbergia arbutifolia, Entada chrysostachys, Keetia zanzibarica* subsp. *cornelioides*, and *Tiliacora funifera,* while smaller species on the river banks include *Phragmites mauritianus, Phyllanthus reticulatus, Physostigma mesoponticum*, and *Urena lobata.*



Abiotic environment and climate

Altitude range of 590 to 720 m asl with a mean of 654 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 61.2% while the similarly measured clay content is 24.5%. Soil pH is 5.8.

Precipitation during driest quarter is 16.5 mm.

Species of Conservation Importance

Endemic Plant Species

Justicia attenuifolia [NE].

Threatened Plant Species

Justicia attenuifolia [VU].

Photographic credits NW of Mandimba, Niassa Province. photo: M.Lotter.

RLE Assessment

Assessment Summary	Assessment Information
This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**	**Criterion A:** Expansion of urban areas, agriculture & deforestation has caused a 29.33% decline since 1750. Least Concern **Criterion B:** This ecosystem has an AOO of 215 10 x 10 km grid cells and an EOO of 24142.72 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern **Criterion C:** Not evaluated **Criterion D:** Degradation assessment shows that 0.5% of the current distribution faces >90 percent degradation severity, 7.13% of the distribution faces >70 percent degradation severity, and 39.01% of the distribution faces >50 percent degradation severity. Least Concern **Criterion E:** Not evaluated

ANGONIA ESCARPMENT MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Miombo da escarapa de Angónia
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Zambezian Wet Miombo

Description

Moist deciduous miombo woodland at altitudes between 700 and 1000 m; poorly documented.

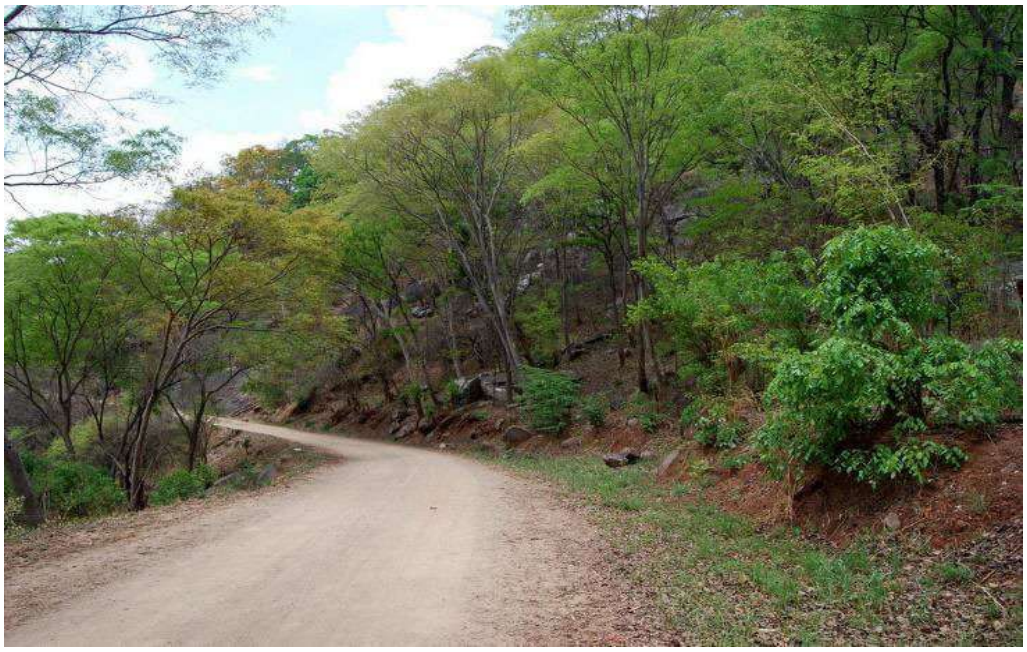
Distribution

Occurring in Zambia, Malawi and Mozambique, between Mualadze southwards to Zobue in Tete Province (north-western Mozambique).

Characteristic native biota

Trees recorded are the miombo elements of *Brachystegia bussei, B. manga, B. boehmii, B. spiciformis, Julbernardia globiflora,* as well as *Afzelia quanzensis, Diplorhynchus condylocarpon, Mimusops zeyheri, Oxytenanthera abyssinica,* and *Piliostigma thonningii.* Small trees and shrubs noted are *Acacia amythethophylla, Baccharoides adoensis* var. *mossambiquensis, Bauhinia petersiana, Gymnanthemum bellinghamii, Jasminum stenolobum, Multidentia crassa, Pavetta crassipes, Sericanthe andongensis* subsp. *andongensis,* and *Tricalysia niamniamensis. Ground flora: Tinnea rhodesiana, Ochna macrocalyx.*

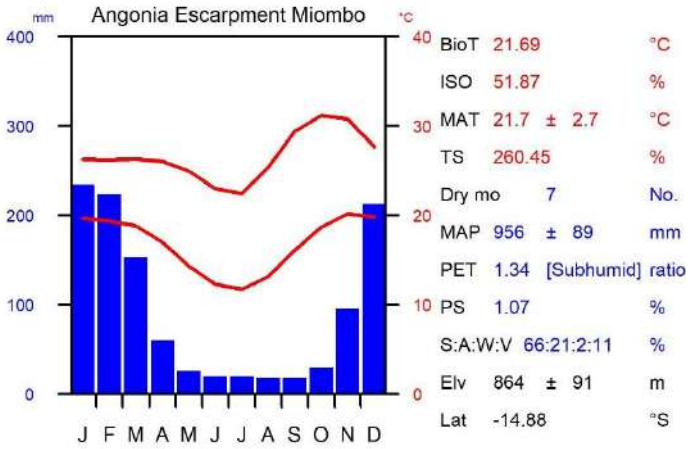
Riparian woodland species include *Albizia glaberrima, Breonadia salicina, Raphia farinifera, Rauvolfia caffra* and *Syzygium cordatum.*



Abiotic environment and climate

Altitude range of 700 to 1065 m asl with a mean of 864 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 68.8% while the similarly measured clay content is 19.1%. Soil pH is 5.8.

Precipitation during driest quarter is 16.9 mm.



Species of Conservation Importance: none recorded.

Photographic credits Between Cazula and Furancungo, Tete Province. photo: J. Burrows

RLE Assessment

Assessment Summary

Found in savannahs of north-western Mozambique, this ecosystem has a restricted geographic distribution but there is little evidence of ongoing declines in extent. However, moderate degradation levels are present across almost the entire distribution of the ecosystem. **Vulnerable**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 26.21% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 144 10 x 10 km grid cells and an EOO of 18049.21 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 25.38% of the current distribution faces >90 percent degradation severity, 43.31% of the distribution faces >70 percent degradation severity, and 89.35% of the distribution faces >50 percent degradation severity. Vulnerable

Criterion E: Not evaluated

ANGONIA MONTANE MOIST MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Miombo húmido de montanha de Angónia
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Zambezian Wet Miombo

Description

Open deciduous miombo woodland to wooded grasslands at altitudes above 1500 m.

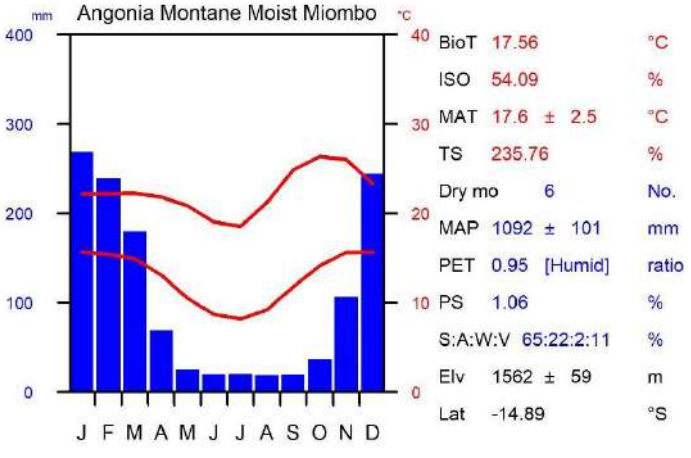
Distribution

Occurs in north-western Mozambique where it borders Malawi on Mt Tsangano and Mt Metuansombe in Tete Province.

Characteristic native biota

A very poorly known open deciduous miombo that occurs above 1500 m on the Angonia plateau area. It is composed of *Brachystegia spiciformis, B. longifolia, Julbernardia paniculata, Protea* spp., *Erica hexandra, Kotschya speciosa, K. strigosa, Uapaca kirkiana* and *U. nitida.*

Herbaceous taxa recorded are *Cymbopogon giganteus, Cyperus esculentus, Vernonia glabra, Aeschynomene mimosifolia, Laggera brevipes, Helichrysum setosum, Baccharoides adoensis, Astripomoea malvacea* and the epiphytic orchid *Bulbophyllum unifoliatum.*



Abiotic environment and climate

Altitude range of 1450 to 1730 m asl with a mean of 1562 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 64.3% while the similarly measured clay content is 22.2%. Soil pH is 5.5.

Precipitation during driest quarter is 22 mm.

Species of Conservation Importance: none recorded.

RLE Assessment

Assessment Summary

This ecosystem has a restricted distribution in Northwest areas of the Tete Province. There is evidence of historical declines and deforestation as well as other threats leading to continuing ongoing declines. **Endangered**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 56.03% decline since 1750. Vulnerable

Criterion B: This ecosystem has an AOO of 9 10 x 10 km grid cells and an EOO of 2844.92 km2. It has undergone substantial historical decline, and there is evidence that deforestation & other threats are leading to continuing decline. Endangered

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 3.25% of the current distribution faces >90 percent degradation severity, 25.13% of the distribution faces >70 percent degradation severity, and 68.31% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

BARUE PLATEAU MOIST MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Miombo húmido do planalto de Bárué
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Zambezian Wet Miombo

Description

Moist deciduous miombo with significant mosaics of *Acacia*, *Combretum*, *Terminalia* and *Upaca*, occurring at altitudes of 400 to 770 metres.

Distribution

Barue Plateau, between Nhampassa, Macossa, and Chitunga-Sede in the south. Occurring in Manica and Sofala Provinces. Only in Mozambique.

Characteristic native biota

Brachystegia boehmii, B. spiciformis, B. utilis, Julbernardia globiflora represent the miombo components of these woodlands, sometimes together being dominant, but often mixed with, or forming mosaics with, the following: *Acacia amythethophylla, A. burkei, A. gerrardii, A. goetzei* subsp. *goetzei, A. nilotica* subsp. *kraussiana, A. polyacantha* subsp. *campylacantha, A. robusta, A. sieberiana* var. *sieberiana, Adansonia digitata, Afzelia quanzensis, Albizia brevifolia, A. harveyi, A. versicolor, Balanites maughamii, Bauhinia galpinii, B. petersiana* subsp. *petersiana, Berchemia zeyheri, Brackenridgea zanguebarica, Burkea africana, Cleistochlamys kirkii, Combretum apiculatum, C. collinum, C. molle, C. zeyheri, Commiphora africana, Crossopteryx febrifugum, Cussonia arborea, C. spicata, Dalbergia boehmii, D. melanoxylon, D. nitidula, Dalbergiella nyassae, Diospyros kirkii, D. mespiliformis, Diplorhynchus condylocarpon, Entada abyssinica, Erythrophleum africanum, Ficus stuhlmannii, F. sur, Ficus sycomorus* subsp. *gnaphalocarpa, Gardenia ternifolia* var. *goetzei, Holarrhena pubescens, Kigelia africana, Kirkia acuminata, Lannea discolor, L. schimperi, Markhamia obtusifolia, M. zanzibarica, Millettia stuhlmannii, Parinari curatellifolia, Philenoptera bussei, Piliostigma thonningii, Pseudolachnostylis maprouneifolia, Pteleopsis myrtifolia, Pterocarpus angolensis, P. brenanii, P. rotundifolius* subsp. *rotundifolius, Schrebera alata, Sclerocarya birrea* subsp. *caffra, Steganotaenia araliacea, Strychnos madagascariensis, S. spinosa, Swartzia madagascariensis, Syzygium guineense* subsp. *guineense, Tabernaemontana elegans, Terminalia sericea, T. stenostachya, Trichilia capitata, Uapaca kirkiana, U. sansibarica, Vangueria infausta, V. payos* var. *glabrescens, Xeroderris stuhlmannii, Ziziphus mauritiana* and *Z. mucronata* subsp. *mucronata.*

Small trees and woody shrubs recorded are *Annona senegalensis, Bridelia cathartica, Catunaregam taylori, Dichrostachys cinerea* subsp. *nyassana, Diospyros loureiriana, D. lycioides* subsp. *sericea, Elephantorrhiza goetzei* subsp. *goetzei, Flacourtia indica, Grewia bicolor, Hexalobus monopetalus* var. *obovatus, Lagynias dryadum, Ochna schweinfurthii, Ormocarpum trichocarpum, Ozoroa obovata, Pavetta schumanniana, Phyllanthus reticulatus, Protea angolensis* var. *divaricata, Rourea orientalis, Senna petersiana, Synaptolepis alternifolia, Ximenia Americana* subsp. *microphylla* and *Ximenia caffra* var *caffra.*

Riparian woodland includes *Antidesma venosum, Breonadia salicina, Cordyla africana, Diospyros mespiliformis, Erythrophleum suaveolens, Ficus capreifolia, Khaya anthotheca, Kigelia pinnata, Philenoptera violacea, Rauvolfia caffra, Syzygium cordatum*, with understorey species such as *Kraussia floribunda, Monodora junodii, Psydrax livida*, and with lianes such as *Adenia gummifera, Dalbergia arbutifolia, D. fischeri, Artabotrys brachypetalus, Grewia flavescens* and *Landolphia kirkii*. At lower altitudes, such as along the Pungwe River, additional species such as *Berchemia discolor, Combretum imberbe, Ficus bussei, F. sycomorus, Lannea schweinfurthii, Trichilia emetica* and *Terminalia prunioides* are added to the list.

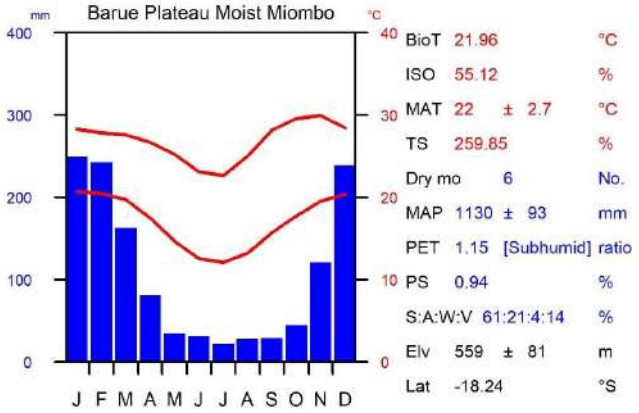
Soft shrubs and herbaceous species include *Cissus cornifolia, Crotalaria anthyllopsis, C. hyssopifolia, Flemingia grahamiana, Gymnanthemum thomsoniana, Hibiscus meeusei, Lapeirousia erythrantha, Margaretta rosea* subsp. *whytei, Neorautanenia mitis, Scutellaria schweinfurthii* subsp. *paucifolia, Sphenostylis erecta, Thunbergia petersiana,* and *Xerophyta humilis.*

The few grasses recorded are *Alloteropsis semialata, Cenchrus purpureus, Hyparrhenia finitima, Hyperthelia dissoluta, Loudetia simplex, Panicum maximum*, and *Setaria sphacelata.*

Abiotic environment and climate

Altitude range of 400 to 775 m asl with a mean of 559 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 63.5% while the similarly measured clay content is 22.8%. Soil pH is 5.8.

Precipitation during driest quarter is 57.5 mm.



Species of Conservation Importance: none recorded.

Photographic credits West of Nhamadze and north of Gorongosa National Park, Sofala Province. photo: M. Stalmans.

RLE Assessment

Assessment Summary

This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 26.09% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 136 10 x 10 km grid cells and an EOO of 14045.29 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.11% of the current distribution faces >90 percent degradation severity, 1.19% of the distribution faces >70 percent degradation severity, and 27.98% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

CHERINGOMA COASTAL MOIST MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Miombo húmido costeiro de Cheringoma
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Zambezian Wet Miombo

Description

Dense semi-deciduous miombo woodland 20-30 m in height, with understorey of forest shrubs, or a wooded grassland with bush/miombo clumps. Understorey of deciduous to semi-evergreen shrubs is normally associated with evergreen forests. The grass cover is generally poor under the canopy, but better developed in more open areas or at the ecotone. Owing to gently undulating plateaux foot slopes here, the unit sometimes forms a woodland-grassland mosaic - slightly higher ridges of sandy soils with miombo woodland separated by wetland grassland or palm savanna in swales, forming a striated pattern. Although the woodland areas are rarely inundated, groundwater must be available at a comparatively shallow depth so the woodland is only briefly deciduous. Rainfall is high and the resultant vegetation is characterized by an abundance of epiphytes (orchids and ferns) receiving additional precipitation from the frequent early morning mist.

Distribution

On east facing slopes on both sides of the Zambezi River. Occurring in Sofala and Zambezia Provinces. Confined to Mozambique.

Characteristic native biota

Main tree species are *Brachystegia spiciformis, Albizia adianthifolia, Anthocleista grandiflora, Erythrophleum suaveolens, Combretum adenogonium, Funtumia africana, Hirtella zanguebarica, Inhambanella henriquesii, Khaya anthotheca, Manilkara discolor, Mascarenhasia arborescens, Pteleopsis myrtifolia, Synsepalum brevipes, Parinari curatellifolia, Tabernaemontana elegans, Trema orientalis, Vitex doniana* and *Voacanga africana*.

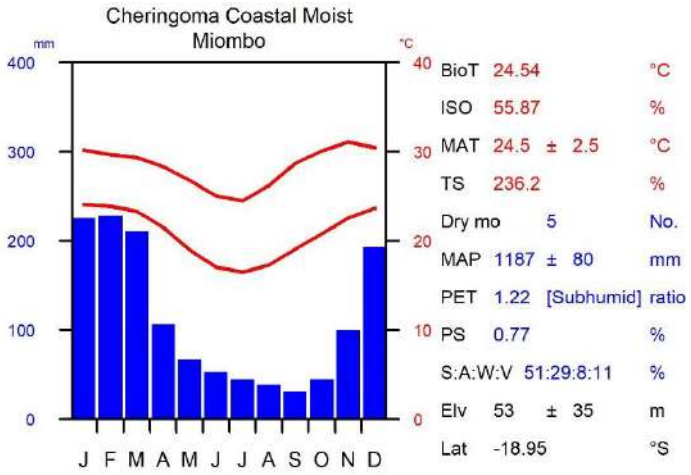
Small trees and shrubs: *Carpolobia suaveolens, Casearia gladiiformis, Craterispermum schweinfurthii, Dovyalis macrocalyx, Garcinia livingstonei, Glyphaea tomentosa, Grewia transzambesica, Hymenocardia acida, Millettia usaramensis, Ochna beirensis, Pseudobersama mossambicensis, Rawsonia lucida, Suregada zanzibarensis, Warneckea sousae, Ximenia caffra* subsp. *natalensis* and *Xylopia gracilipes*. On more open sandy areas occur stands of *Erica simii* and *Morella spathulata*.

Recorded lianes and climbers include *Entada rheedii*, *Flagellaria indica, Landolphia kirkii, Mezoneuron angolense* and *Toddalia asiatica*. Grasses include *Hyparrhenia diplandra* and *Oryza longistaminata*.

Abiotic environment and climate

Altitude range of 7 to 160 m asl with a mean of 53 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 63.5% while the similarly measured clay content is 21.6%. Soil pH is 6.1.

Precipitation during driest quarter is 66 mm.



Species of Conservation Importance

Endemic Plant Species

Liparis hemipilioides [E], *Ochna beirensis* [E], *Pavetta pumila* [E], *Psydrax micans* [NE], *Siphonochilus kilimanensis* [E], *Tarenna longipedicellata* [E], *Tricliceras lanceolatum* [E].

Threatened Plant Species

Ochna beirensis [EN], *Pavetta pumila* [VU], *Psydrax micans* [VU], *Siphonochilus kilimanensis* [VU], *Tarenna longipedicellata* [VU], *Tricliceras lanceolatum* [VU].

Photographic credits *Left & right*: Miombo woodlands on Cheringoma plateau, south of Zambezi River. photos: M. Stalmans.

RLE Assessment

Assessment Summary

This ecosystem has a restricted geographic distribution but there is little evidence of ongoing declines in extent. However, moderate degradation levels are present across most of the distribution of the ecosystem. **Vulnerable**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 6.37% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 106 10 x 10 km grid cells and an EOO of 15957.92 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 15.54% of the current distribution faces >90 percent degradation severity, 35.01% of the distribution faces >70 percent degradation severity, and 83.66% of the distribution faces >50 percent degradation severity. Vulnerable

Criterion E: Not evaluated

CHERINGOMA ESCARPMENT MOIST MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Miombo húmido da escarpa de Cheringoma
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Zambezian Wet Miombo

Description

Deciduous miombo on the drier westwards sloping shoulder of the Cheringoma Escarpment, predominantly on limestone substrates with argillaceous sandstones in the south. Mosaic of closed deciduous miombo woodlands with narrow, mostly evergreen, riverine forested fringes, drier woodland on very shallow rocky limestone pavement, grassy dambos and small to large areas of open *Combretum*-dominated woodlands, especially in the south on eroded, more clayey and poorly drained soils.

Distribution

Westwards sloping shoulder of the Cheringoma Plateau, predominantly on limestone substrates with argillaceous sandstones in the south. Occurring in Sofala Province.

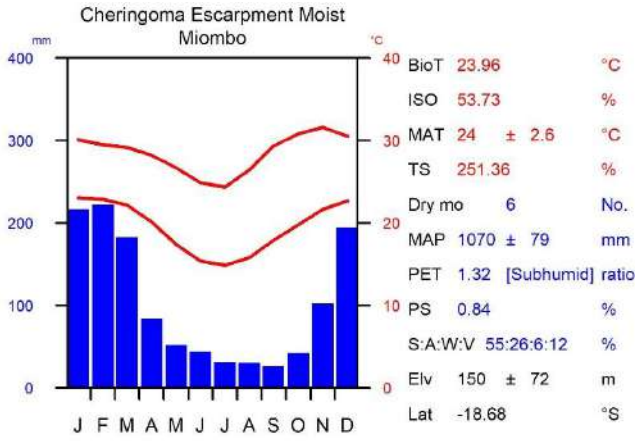
Characteristic native biota

The canopy is dominated with *Brachystegia spiciformis* and *Julbernardia globiflora*. Other species recorded here include *Acacia* species (*A. nigrescens. A. adenocalyx, A. gerrardii*), *Burkea africana*, *Combretum adenogonium, C. molle, C. paniculatum, Diplorhynchus condylocarpon, Philenoptera bussei, Pterocarpus angolensis, P. brenanii, P. rotundifolius* subsp. *polyanthus, Dalbergia nitidula, Amblygonocarpus andongensis, Lannea discolor, Millettia stuhlmannii, Olax dissitiflora, Pericopsis angolensis, Philenoptera violacea, Pseudolachnostylis maprouneifolia, Ozoroa obovata* subsp. *elliptica, Antidesma venosum, Xeroderris stuhlmannii, Maytenus undata, Entada abyssinica, Cassia afrofistula,* and *Carissa praetermissa.Androstachys* scrub-thicket occurs on limestone along the rim of steeply incised limstone gorges. Tree cover in parts is dense but stunted with *Androstachys johnstonii* as a dominant species and *Euphorbia halipedicola* and *Vanilla roscheri*. Other species include *Crossopteryx febrifuga*, *Commiphora africana, Elaeodendron matabelicum, Synadenium cupulare, Turraea floribunda, Mezoneuron angolense, Vepris reflexa, Cissus integrifolia,* and *Combretum umbricola.* Climbers include *Landolphia kirkii* and*, Mezoneuron angolense.* Bamboo (*Oxytenanthera abyssinica*) is rare within this unit.

Abiotic environment and climate

Altitude range of 20 to 295 m asl with a mean of 150 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 63.0% while the similarly measured clay content is 22.4%. Soil pH is 6.1.

Precipitation during driest quarter is 60.1 mm.



Species of Conservation Importance

Endemic Plant Species

Cola cheringoma [E], *Pavetta pumila* [E].

Threatened Plant Species

Cola cheringoma [EN], *Pavetta pumila* [VU].

Biogeographic Anomalies

Species of particular interest are *Disperis johnstonii* (Orchidaceae), recently recorded from Mozambique for the first time; *Nesogenes madagascariensis* (Nesogenaceae); which until now had only been recorded from northern Mozambique, and *Huernia verekeri* subsp. *pauciflora* (Apocynaceae), a taxon previously known only from the Save River mouth near Mambone, more than 250 km further South. This latter taxon should be considered a Mozambique endemic.

Photographic credits *Left & right*: Cheringoma Plateau escarpment. photos: M. Stalmans.

RLE Assessment

Assessment Summary

This ecosystem has a restricted geographic distribution but there is little evidence of ongoing declines in extent. However, moderate degradation levels are present across most of the distribution of the ecosystem. **Vulnerable**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 14.71% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 39 10 x 10 km grid cells and an EOO of 3048.57 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 7.89% of the current distribution faces >90 percent degradation severity, 27.4% of the distribution faces >70 percent degradation severity, and 98.09% of the distribution faces >50 percent degradation severity. Vulnerable

Criterion E: Not evaluated

CHERINGOMA PLATEAU MOIST MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Miombo húmido do planalto de Cheringoma
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Zambezian Wet Miombo

Description

Usually, a tall evergreen closed woodland in higher lying areas on sandy soils. Rainfall is high and the resultant vegetation is characterized by an abundance of epiphytes (orchids and ferns) receiving additional precipitation from the frequent early morning mist. Composed of tall *Pteleopsis myrtifolia* and *Erythrophleum suaveolens*, mixed with woodland of *Brachystegia spiciformis-Julbernardia globiflora*. The woodland is generally, but not always, tall. *Hirtella zanguebarica* is often present. In more localised areas there is a dense deciduous forest of *Milicia excelsa* and *Millettia stuhlmannii*, or tree savanna genera of a drier type such as *Xeroderris*, *Sclerocarya*, *Acacia* and *Ziziphus*. There are also dense thickets of *Grewia transzambesic*a, *Pseudobersama mossambicensis*, *Monanthotaxis buchananii*, *Harungana madagascariensis*, *Landolphia kirkii, Diodia scandens*, *Rinorea angustifolia* subsp. *ardisiiflora*, etc.

Distribution

Along the NNE-SSW axis of the Cheringoma Plateau in north-eastern Sofala Province.

Characteristic native biota

The dominant canopy species is *Brachystegia spiciformis* but also with *Albizia versicolor, Amblygonocarpus andongensis, Cleistochlamys kirkii, Cordyla africana, Dalbergia boehmii, Ekebergia capensis, Erythrophleum suaveolens, Hirtella zanguebarica, Julbernardia globiflora, Millettia stuhlmannii, Mimusops obtusifolia, Parinari curatellifolia, Pteleopsis myrtifolia, Pterocarpus angolensis, Uapaca nitida, U. sansibarica* and *Vitex doniana.*

Smaller trees and shrubs, sometimes forming thickets, include *Casearia gladiiformis, Carpolobia suaveolens,` Dichapetalum barbosae, Diospyros natalensis, D. verrucosa, Diplorhynchus condylocarpon, Embelia xylocarpa, Euclea natalensis subsp. obovata, Eugenia verdcourtii, Friesodielsia obovata, Grewia microcarpa, G. transzambesica, Gymnosporia mossambicensis, Harungana madagascariensis, Hymenocardia acida, Landolphia kirkii, Leptactina delagoensis, Monanthotaxis buchananii, M. trichocarpa, Millettia usaramensis, Pseudobersama mossambicensis,*

Psorospermum febrifugum, Psychotria capensis subsp. capensis, P. pumila var. pumila, Pyrostria bibracteata, Ochna angustata, Searsia natalensis, Sphaerocoryne gracilis subsp. gracile, etc.

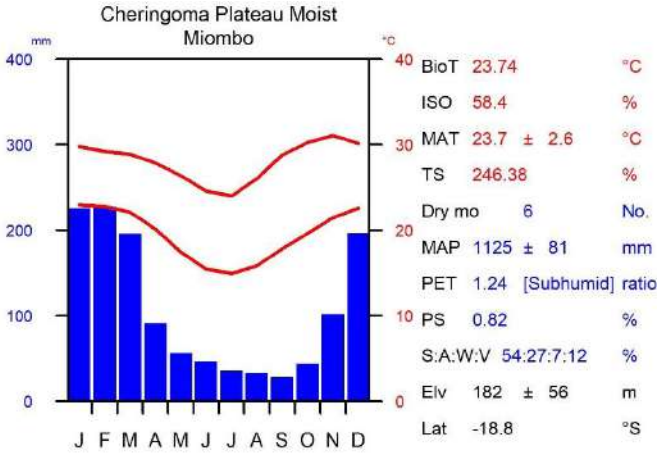
Dense stands of the fern *Pteridium aquilinum* or the gingers *Aframomum alboviolaceum* and *Siphonochilus aethiopicus,* form a mosaic with short grasses such as *Olyra latifolia, Megastachya mucronata,* and *Setaria megaphylla.*

Epiphytes are abundant on the older trees and include orchids (*Bulbophyllum* spp., *Cyrtorchis arcuata and Diaphananthe fragrantissima*, etc.), ferns (*Platycerium alcicorne, P. elephantotis, Asplenium* spp., *Davallia chaerophylloides, Microsorum punctatum*, etc.) and the epiphytic Cactaceae *Rhipsalis baccifera.* Climbers and lianes include *Artabotrys brachypetalus, Asparagus falcatus, A. petersianus, Flagellaria guineense, Tiliacora funifera and Toddalia asiatica.*

Abiotic environment and climate

Altitude range of 30 to 310 m asl with a mean of 182 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 63.3% while the similarly measured clay content is 21.3%. Soil pH is 6.0.

Precipitation during driest quarter is 64.8 mm.



Species of Conservation Importance

Endemic Plant Species

Celosia pandurata [E], *Pavetta pumila* [E], *Psydrax micans* [NE].

Threatened Plant Species

Pavetta pumila [VU], *Psydrax micans* [VU], *Tarenna longipedicellata* [VU].

Biogeographic Anomalies

Platycerium elephantotis (Polypodiaceae) is a rare constituent of these woodlands and is threatened locally by logging activities.

Photographic credits *Top left*: an old *Brachystegia spiciformis* festooned with epiphytes, including *Platycerium alcicorne* and *Davallia chaerophylloides*. photo: J. Burrows; *top right*: aerial view just east of Galinha (Cheringoma Plateau) of woodland-grassland mosaic. photo: M. Stalmans; *bottom*: Miombo woodland with the ground layer dominated by *Pteridium* and *Afromomum*; near Muanza, Sofala Province. photo: J. Burrows.

RLE Assessment

Assessment Summary	Assessment Information
This ecosystem has a restricted geographic distribution but there is little evidence of ongoing declines in extent. However, moderate degradation levels are present across most of the distribution of the ecosystem. **Vulnerable**	**Criterion A:** Expansion of urban areas, agriculture & deforestation has caused a 5.85% decline since 1750. Least Concern **Criterion B:** This ecosystem has an AOO of 72 10 x 10 km grid cells and an EOO of 5928.42 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern **Criterion C:** Not evaluated **Criterion D:** Degradation assessment shows that 16.42% of the current distribution faces >90 percent degradation severity, 36.33% of the distribution faces >70 percent degradation severity, and 94.42% of the distribution faces >50 percent degradation severity. Vulnerable **Criterion E:** Not evaluated

CHIMANIMANI MONTANE MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Miombo de Montana de Chimanimani
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Zambezian Wet Miombo

Description

Deciduous miombo woodland dominated by *Brachystegia microphylla*, with a canopy 10-15 m high with 60-70% cover.

Distribution

On eastern slopes of Chimanimani Mountains above lowland forest. Occurring in Manica Province. Also occurs in Zimbabwe.

Characteristic native biota

The widespread miombo component is composed of *Brachystegia microphylla* (dominant, especially on quartzite ridges), *B. boehmii, B. spiciformis, B. utilis,* and *Julbernardia globiflora*.

Other typical trees are *Acacia amythethophylla, A. sieberiana* var. *woodii, Albizia petersiana* subsp. *petersiana, A. schimperiana* var. *amaniensis, A. versicolor, Antidesma venosum, Combretum molle, C. zeyheri, Dombeya rotundifolia, Erythrina lysistemon, Faurea rochetiana, Ficus sur, Parinari curatellifolia, Pericopsis angolensis, Pseudolachnostylis maprouneifolia, Pterocarpus angolensis, Searsia chirindensis, S. dentata, Strychnos spinosa, Syzygium guineense* subsp. *guineense,* and *Vitex payos* var. *glabrescens*.

Small trees and woody shrubs: *Albizia antunesiana, Annona senegalensis, Coptosperma supra-axillare, Diospyros lycioides* subsp. *sericea, Gymnanthemum amygdalinum, Protea gaguedi, P. petiolaris, Pavetta gardeniifolia, Psorospermum febrifugum, Vangueria infausta,* and *Ximenia caffra* var. *caffra.*

Streamlines typically support the tree fern *Cyathea dregei,* the wild banana *Ensete ventricosum*, and trees and shrubs such as *Aphloia theiformis, Bridelia micrantha, Embelia schimperi, Dissotis princeps, Hypericum roeperianum, Ilex mitis, Itea rhamnoides, Pittosporum viridiflorum, Psydrax kraussioides, Syzygium cordatum, Terminalia gazensis, Trimeria grandifolia,* and *Vangueria apiculata.*

Soft shrubs and herbaceous species: *Acalypha fimbriata, A. petiolaris, A. segetalis, Afroligusticum claessensii, Crassocephalum rubens, Eriosema buchananii, Erythrocephalum zambesianum, Fadogia tetraquetra* var. *grandiflora, Gnidia chrysantha, Hibiscus fuscus,*

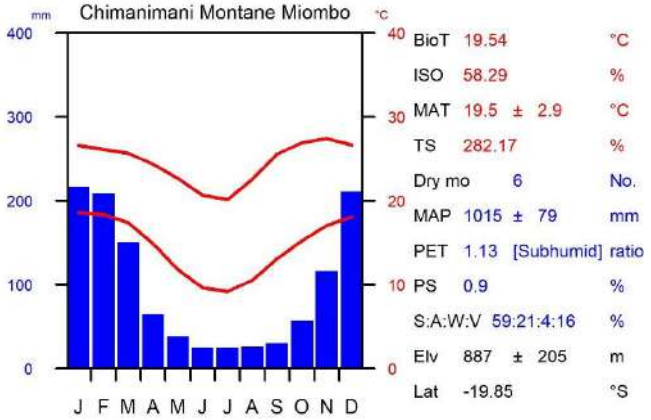
Jasminum brachyscyphum, Lablab purpureus subsp. *uncinatus, Lantana swynnertonii, Macrotyloma axillare, Pachycarpus chirindensis, Rhynchosia chimanimaniensis, R. sordida, Solanum anguivi, Sphenostylis stenocarpa, Tephrosia praecana,* and *Vigna vexillata* var. *angustifolia*. A few grasses *are Andropogon eucomus* subsp. *huillensis, Digitaria gazensis, Hyparrhenia filipendula, H. dichroa, Leptaspis cochleata, Loudetia simplex, Panicum maximum, Pseudechinolaena polystachya,* and *Themeda triandra.*

Patches of the bracken fern, *Pteridium aquilinum* subsp. *caffrum*, are widespread and diagnostic.

Abiotic environment and climate

Altitude range of 425 to 1400 m asl with a mean of 887 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 53.0% while the similarly measured clay content is 30.7%. Soil pH is 5.7.

Precipitation during driest quarter is 49.9 mm.



Species of Conservation Importance

Endemic Plant Species

Aeschynomene aphylla [NE], *Afrocanthium ngonii* [NE], *Clerodendrum robustum* var. *macrocalyx* [E], *Coffea salvatrix* [NE], *Crepidorhopalon flavus* [NE], *Danthoniopsis chimanimaniensis* [NE], *Dissotis pulchra* [NE], *Dissotis swynnertonii* [NE], *Encephalartos chimanimaniensis* [NE], *Ficus muelleriana* [E*], *Gutenbergia westii* [NE], *Otiophora lanceolata* [NE], *Pachycarpus chirindensis* [NE], *Sericanthe chimanimaniensis* [NE], *Struthiola montana* [NE], *Tephrosia chimanimaniana* var. nov. [NE], *Tephrosia praecana* [NE].

Threatened Plant Species

Aeschynomene aphylla [VU], *Afrocanthium ngonii* [VU], *Coffea salvatrix* [EN], *Crepidorhopalon flavus* [VU], *Danthoniopsis chimanimaniensis* [EN], *Dissotis pulchra* [VU], *Dissotis swynnertonii* [VU], *Encephalartos chimanimaniensis* [EN], *Ficus muelleriana* [EN], *Gutenbergia westii* [VU], *Otiophora lanceolata* [VU], *Sericanthe chimanimaniensis* [VU], *Struthiola montana* [DD], *Tephrosia praecana* [VU].

Photographic credits *Top & bottom*: the eastern base of the Chimanimani Mts, Musapa Gap. photos: M. Lotter.

RLE Assessment

Assessment Summary

This ecosystem has a restricted geographic distribution but there is little evidence of ongoing declines in extent. However, moderate degradation levels are present across most of the distribution of the ecosystem. **Vulnerable**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 48.89% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 41 10 x 10 km grid cells and an EOO of 5996.49 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 15.48% of the current distribution faces >90 percent degradation severity, 50.99% of the distribution faces >70 percent degradation severity, and 92.93% of the distribution faces >50 percent degradation severity. Vulnerable

Criterion E: Not evaluated

CHIMOIO MOIST MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Miombo húmido do Chimioio
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Zambezian Wet Miombo

Description

A relatively wet semi-deciduous miombo woodland with a mean annual rainfall of 1050 mm.

Distribution

Manica Province, between Vanduzi near Chimoio and the base of the Chimanimani Mountains in the south. Probably extending into Zimbabwe.

Characteristic native biota

The miombo elements are *Brachystegia boehmii, B. spiciformis, B. utilis, Julbernardia globiflora,* together often dominant, but may be mixed with, or form mosaics with the following: A*cacia amythethophylla, A. burkei, A. goetzei* subsp. *goetzei, A. karroo, A. nilotica* subsp. *kraussiana, A. polyacantha* subsp. *campylacantha, A. sieberiana* var. *sieberiana, Albizia adianthifolia, A. anthelmintica, A. antunesiana, A. harveyi, A. versicolor, Amblygonocarpus andongensis, Antidesma venosum, Azanza garckeana, Bauhinia galpinii, B. petersiana* subsp. *petersiana, Bersama abyssinica* subsp. *abyssinica, Boscia salicifolia, Brackenridgea zanguebarica, Bridelia micrantha, Burkea africana, Cassia abbreviata* subsp. *beareana, Combretum collinum, C. molle, Crossopteryx febrifugum, Cussonia arborea, Dalbergia boehmii, D. melanoxylon, D. nitidula, D. obovata, Dalbergiella nyassae, Diospyros mespiliformis, Diplorhynchus condylocarpon, Dombeya rotundifolia, Entada abyssinica, Erythrina abyssinica, E. lysistemon, Erythrophleum africanum, Faurea rochetiana, F. saligna, Ficus stuhlmannii, F. sur, Ficus sycomorus* subsp. *gnaphalocarpa, Gardenia ternifolia* var. *goetzei, Heteromorpha arborescens* var. *abyssinica, Holarrhena pubescens. Kigelia africana, Lannea schimperi, Markhamia obtusifolia, Millettia stuhlmannii, Monotes africanus, M. engleri, Mundulea sericea, Olax dissitiflora, Oxytenanthera abyssinica, Peltophorum africanum, Pericopsis angolensis, Philenoptera violacea, Piliostigma thonningii, Pittosporum viridiflorum, Pleurostylia africana, Pseudolachnostylis maprouneifolia, Pteleopsis myrtifolia, Pterocarpus angolensis, P. rotundifolius* subsp. *rotundifolius, Sclerocarya birrea* subsp. *caffra, Securidaca longepedunculata, Strychnos madagascariensis, S. spinosa, S. potatorum, Swartzia madagascariensis, Syzygium guineense* subsp. *guineense, Tabernaemontana elegans, Terminalia sericea, T. stenostachya, Turraea nilotica, Uapaca kirkiana, U. sansibarica, Vangueria infausta, V. madagascariensis, Vangueria randii* subsp. *randii, Vitex doniana, V. mombassae, V. payos* var. *glabrescens, Xeroderris stuhlmannii, and Ziziphus mucronata* subsp. *mucronata*.

Small trees and woody shrubs recorded are *Abrus precatorius, Acacia schweinfurthii, Aeschynomene abyssinica, Allophylus rubifolius, Annona senegalensis, Bridelia cathartica, Catunaregam swynnertonii, C. taylori, Clerodendrum pleiosciadium, C. robustum, Dichrostachys cinerea* subsp. *nyassana, Diospyros lycioides* subsp. *sericea, Dissotis princeps* var. *princeps, Dodonaea viscosa, Ehretia amoena, Elephantorrhiza goetzei* subsp. *goetzei, E. suffruticosa, Erythroxylum emarginatum, Flacourtia indica, Gymnanthemum amygdalinum, G. coloratum, Gymnosporia buxifolia, Hexalobus monopetalus* var. *obovatus, Hymenocardia acida, Keetia gueinzii, K. venosa, Lagynias dryadum, Ochna puberula, O. schweinfurthii, Oncoba spinosa, Ormocarpum trichocarpum, Ozoroa obovata, Pavetta schumanniana, Protea angolensis* var. *divaricata, Psorospermum febrifugum, Psychotria kirkii, Rotheca myricoides* f. *alatipetiolata*, *and* f. *discolor, Rourea*

orientalis, Searsia tenuinervis, Senna petersiana, Synaptolepis alternifolia, Vernonia rhodanthoidea, and *Ximenia caffra* var. *caffra*.

Some of the soft shrubs and herbaceous species recorded are *Aeschynomene abyssinica, A. schimperi, Ampelocissus obtusata* subsp. *kirkiana, Asparagus virgatus, Cayratia gracilis, Chamaecrista zambesica, Chlorophytum andongense, Chlorophytum blepharophyllum, C. macrosporum, C. subpetiolatum, Cissus integrifolia, Crossandra puberula, Crotalaria calycina, C. hyssopifolia, C. juncea, C. laburnifolia, C. lachnophora, C. lanceolata, C. pallidicaulis, C. recta, C. virgulata* subsp. *virgulata, Crinum stuhlmannii* subsp. *delagoense, Cryptolepis apiculata, C. oblongifolia, Cycnium adonense, Cyphostemma bororense, C. buchananii, C. lynesii, C. rhodesiae, Dalechampia parvifolia, Dolichos kilimandscharicus* var. *kilimandscharicus, Emilia coccinea, Endostemon obtusifolius, Eriosema pauciflorum, E. psoraleoides, Eriospermum flagelliforme, Erythrocephalum longifolium, Eulophia longisepala, Flemingia grahamiana, Hibiscus cannabinus, Hibiscus kirkii, H. physaloides, Hypericophyllum elatum, Indigofera emarginella* var. *emarginella, I. swaziensis, Justicia bracteata, J. matammensis, J. striata* var. *striata, J. whytei, Kalanchoe lateritia, Leonotis ocymifolia* var. *raineriana, Monanthotaxis obovata, Nervilia kotschyi, Pachycarpus lineolatus, Paramollugo nudicaulis, Polystachya valentina, Pseudarthria hookeri* var. *hookeri, Rhynchosia procurrens* subsp. *floribunda, Sida cordifolia, Sida pseudocordifolia, Siphonochilus aethiopicus, Stathmostelma pauciflorum, Tacca leontopetaloides, Tephrosia rhodesica* var. *rhodesica, Thunbergia crispa, T. lancifolia, Trachyandra saltii, Tragia kirkiana*, and *Triumfetta rhomboidea.*

Climbers and lianes include *Artabotrys brachypetalus, Cissampelos mucronata, Clematis villosa, Dioscorea cochleariapiculata, Dioscorea quartiniana, Helinus integrifolius, Ipomoea verbascoidea, Jacquemontia tamnifolia, Jasminum streptopus, Landolphia kirkii, Mucuna coriacea* subsp. *irritans, M. pruriens, Rhoicissus revoilii, Smilax anceps, Sphedamnocarpus pruriens* var. *pruriens, Stephania abyssinica, Stictocardia laxiflora* var. *laxiflora*, and *Tylosema fassoglensis.*

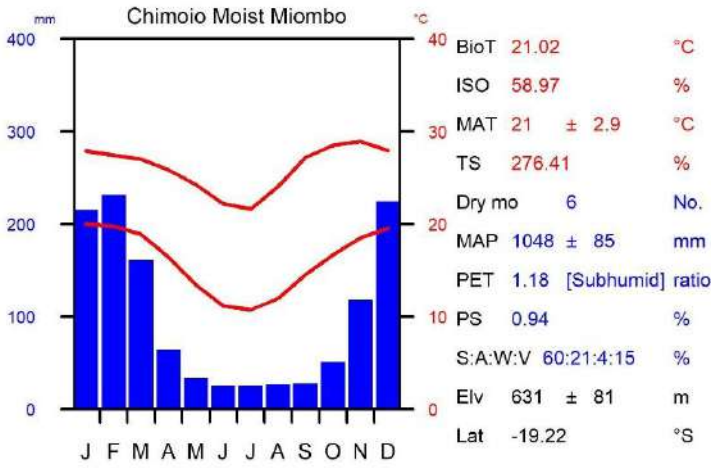
Grasses recorded are *Alloteropsis semialata, Andropogon gayanus, A, schirensis, Brachiaria brizantha, B. dictyoneura, Cenchrus purpureus, C. unisetus, Chloris pycnothrix, Cymbopogon caesius* subsp. *giganteus, Digitaria gazensis, Diheteropogon amplectens* var. *catangensis, Eleusine indica, Eragrostis aspera, E. chapelieri, E. pilosa, E. superba, Eustachys paspaloides, Heteropogon melanocarpus, Hyparrhenia filipendula* var. *filipendula, Leptaspis zeylanica, Loudetia simplex, Melinis repens* subsp. *repens, Panicum dregeanum, P. laticomum, P. maximum, Pennisetum glaucum, Perotis patens, Phyllorachis sagittata, Pogonarthria squarrosa, Sacciolepis curvata, Setaria homonyma, Sporobolus pyramidalis, S. stapfianus, Tripogon leptophyllus, Tristachya nodiglumis, Urochloa mossambicensis,* and the sedges *Bulbostylis pilosa* and *Cyperus amabilis.*

Riparian woody vegetation has, among others, *Bersama abyssinica* subsp. *abyssinica, Breonadia salicina, Celtis africana, Dalbergia arbutifolia, D. lactea, Diospyros mespiliformis, Erythrophleum suaveolens, Khaya anthotheca, Phoenix reclinata, Syzygium cordatum, Zanha golungensis, Vitex doniana*, with the smaller *Dombeya burgessiae, Keetia venosa,* and *Polysphaeria lanceolata.*

Abiotic environment and climate

Altitude range of 415 to 810 m asl with a mean of 631 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 67.8% while the similarly measured clay content is 20.3%. Soil pH is 5.9.

Precipitation during driest quarter is 44.7 mm.



Species of Conservation Importance

Endemic Plant Species

Coffea salvatrix [NE], Crassula *leachii* [E], *Polygala zambesiaca* [NE].

Threatened Plant Species

Coffea salvatrix [EN], *Crassula leachii* [EN], *Polygala zambesiaca* [VU].

Photographic credits Miombo woodland in the eastern foothills of the Chimanimani Mts. photo: J. Burrows.

RLE Assessment

Assessment Summary

This ecosystem has declined by more than 55% since 1750 due to expansion of agriculture, urban areas and deforestation. **Vulnerable**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 55.99% decline since 1750. Vulnerable

Criterion B: This ecosystem has an AOO of 79 10 x 10 km grid cells and an EOO of 6975.45 km2. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 1.59% of the current distribution faces >90 percent degradation severity, 6.82% of the distribution faces >70 percent degradation severity, and 61.1% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

CHOA ESCARPMENT MOIST MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Miombo humido da escarpa de Choa
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Zambezian Wet Miombo

Description

Moist deciduous miombo woodland along the eastern slopes and foothills.

Distribution

Along the base and east-aspect slopes of the Choa Mt, between Manica and Guro in the north. Occurring in Manica Province. Also in Zimbabwe.

Characteristic native biota

The trees are dominated by *Brachystegia boehmii, B. spiciformis, Julbernardia globiflora, Burkea africana,* and *Parinari curatellifolia.* Co-occurring trees are *Acacia amythethophylla, Albizia adianthifolia, Albizia antunesiana, Bauhinia petersiana, Combretum molle, C. psidioides, Entada abyssinica, Faurea rochetiana, F. saligna, Maesa rufescens*, *Ochna schweinfurthiana, Parinari curatellifolia, Pericopsis angolensis, Protea angolensis* var. *divaricata, Pseudolachnostylis maprouneifolia, Pterocarpus rotundifolius* subsp. *rotundifolius, Swartzia madagascariensis, Syzygium afromontanum, Terminalia stenostachya, Uapaca kirkiana, U. sansibarica, U. nitida, Vitex doniana,* and *Xeroderris stuhlmannii.*

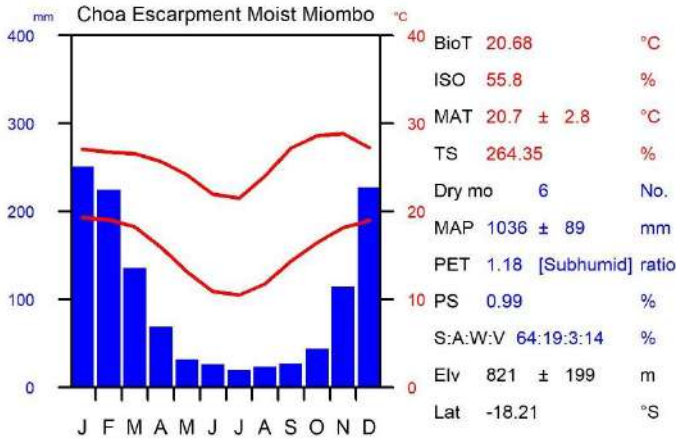
Shrubs and climbers include *Annona senegalensis, Dalbergia lactea, D. nitidula, Dalbergiella nyasae, Flemingia grahamiana, Mucuna coriacea, Protea gaguedi,* and *Syzygium guineense* subsp. *huillense.*

Herbaceous shrublets include *Chamaecrista parva, Sphenostylis erecta, Vigna vexillata,* and grasses recorded are *Beckeropsis uniseta, Cymbopogon validus, Hyparrhenia filipendula, Loudetia* spp., *Melinis* spp., *Sporobolus* spp., *Setaria* spp., *Pennisetum* spp., and *Themeda triandra*. The bracken fern *Pteridium aquilinum* is sometimes important in the grass stratum.

Abiotic environment and climate

Altitude range of 550 to 1370 m asl with a mean of 821 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 55.3% while the similarly measured clay content is 29.6%. Soil pH is 5.8.

Precipitation during driest quarter is 43.6 mm.



Species of Conservation Importance

Endemic Plant Species

Rotheca teaguei [NE].

Photographic credits the eastern slopes of Choa Mt, above Catandica, Manica Province. photo: J. Burrows.

RLE Assessment

Assessment Summary

This ecosystem has faced significant historical declines, has a very restricted geographic distribution with evidence that deforestation & other threats are leading to continuing decline of continuing ongoing declines and widespread degradation distribution. **Endangered**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 47.56% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 62 10 x 10 km grid cells and an EOO of 6450.9 km2. It has undergone historical decline, and there is evidence that deforestation & other threats are leading to continuing decline. Endangered

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 39.01% of the current distribution faces >90 percent degradation severity, 65.74% of the distribution faces >70 percent degradation severity, and 84.83% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

COASTAL BERLINIA MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Miombo costeiro de Berlinia
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Zambezian Wet Miombo

Description

Open to closed miombo woodland type, with a sparse to well developed grass layer, interspersed with patches or areas of thicket and sometimes small pockets of coastal forest. The canopy, sometimes close, varies from 4–15 m tall, with *Berlinia orientalis* being the dominant tree species.

Distribution

In northern Mozambique, just south of the Rovuma River and along the coast, from Quigodo to Mucojo. Occurring in Cabo Delgado Province. Probably also extending into Tanzania.

Characteristic native biota

Together with *Berlinia orientalis, Brachystegia spiciformis* is occasionally co-dominant, as well as *Manilkara sansibarensis, Mimusops obtusifolia, Uapaca sansibarica* and *U. nitida.* Apart from the species mentioned above, the main tree species are *Afzelia quanzensis, Albizia adianthifolia, A. forbesii, Amblygonocarpus andongensis, Brachystegia allenii, Cleistanthus schlechteri, Erythrina suaveolens, Hymenaea verrucosa, Parinari curatellifolia, Pteleopsis myrtifolia,* and *Vitex doniana*. Smaller or less frequent tree species recorded are *Acacia nilotica* subsp. *kraussiana, A. sieberiana* var. *sieberiana, Albizia petersiana* subsp. *petersiana, Baphia macrocalyx, B. punctulata* subsp. *palmensis, Brackenridgea zanguebarica, Cleistochlamys kirkii, Dalbergia nitidula, Fernandoa magnifica, Harrisonia abyssinica, Manilkara sansibarensis, Olax dissitiflora, Philenoptera bussei, Phyllocosmus lemaireanus, Schrebera trichoclada, Swartzia madagascariensis, Tetracera boiviniana, Thespesia mossambicensis, Vangueria domatiosa* and *Zanthoxylum lindense*. Riparian areas support *Homalium abdessammadii, Mascarenhasia arborescens, Raphia farinifera* and *Syzygium niassensis*.

The sub-canopy strata of this vegetation type are characterised by a much higher diversity of woody shrubs and small trees than the canopy. These include diagnostic species such as *Baphia macrocalyx* (which is sometimes dominant), including *Allophylus rubifolius, Annona senegalensis, Cassia afrofistula* subsp. *afrofistula, Combretum pentagonum, Craterispermum schweinfurthii, Dichapetalum aureonitens, D. barbosae, D. macrocarpum, D. mossambicense, Dichrostachys cinerea* subsp. *forbesii, Diospyros loureiriana, Erythroxylum platyclados, Euclea natalensis* subsp. *obovata, Grewia limae, Gymnosporia buchananii, Margaritaria discoidea* var. *triplosphaera, Markhamia obtusifolia, Mimosa busseana, Monodora grandidieri, Mundulea sericea, Ochna kirkii, O. polyneura, Ormocarpum schliebenii, Pancovia holtzii* subsp. *holtzii, Phellocalyx vollesenii, Phyllanthus reticulatus, Polysphaeria multiflora, Psorospermum febrifugum, Rourea coccinea* subsp. *boiviniana, R. orientalis, Senna petersianus, Tinnea zambesiaca, Vangueria infausta, Vangueriopsis lanciflora, Xylia africana, Ximenia caffra* and *Xylotheca tettensis* var. *kirkii*. Woody climbers are quite a prominent growth form and include *Abrus precatorius, Entada stuhlmannii, Dalbergia bracteolata, Millettia impressa* subsp. *goetzeana*, and *Rhoicissus revoilii.*

Patches of Rovuma Basin Coastal Thicket-Forest are described elsewhere but species particularly recorded from the thickets within the Coastal Berlinia Woodland are *Bosqueiopsis carvalhoana, Chassalia colorata, Coptosperma supra-axillare, Crossopetalum mossambicense, Didymosalpinx callianthus, Diospyros consolatae, D. mafiensis, D.*

verrucosa, Garcinia acutifolia, Grewia spp. *(conocarpa, forbesii, microcarpa, transzambesica, triflora), Heinsia crinita* subsp. *parviflora, H. zanzibarica, Homalium longistylum, Maerua acuminata, Maprounea africana, Monodora minor, Paropsia braunii, Pavetta decumbens, P. lindina, Pentarhopalopilia umbellulata, Ritchiea capparoides* var. *capparoides, Salacia orientalis, Schlechterina mitostemmatoides, Sphaerocoryne gracilis, Strychnos panganensis, Triainolepis africana* subsp. *hildebrandtii, Tricalysia semidecidua, Uvaria acuminata, U. kirkii, Vismianthus punctatus, Xylopia collina,* and *Xylopia tenuipetala.*

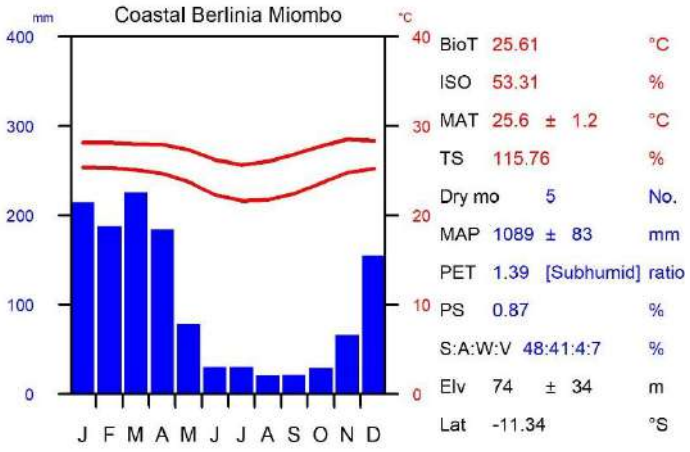
Smaller shrubs, herbaceous species and graminoids recorded from both vegetation types are: *Aeschynomene cristata, A. uniflora, Aneilema petersii* subsp. *petersii, Antherotoma debilis, Asparagus petersianus, Barleria repens, Chamaecrista polytricha, Crotalaria* spp. *(bernieri, goreensis, kirkii, laburnoides), Cyperus amabilis, C. hemisphaericus, Cyphostemma bororensis, Dioscorea cochleari-apiculata, Eulophia angolensis, E. longisepala, Flagellaria guineensis, Gladiolus decoratus, Gloriosa superba, Gonatopus boivinii, Hoslundia opposita, Melhania forbesii, Mimosa pigra, Pentodon pentandrus, Platycoryne pervillei, Sansevieria subspicata, Solanum tettense, Stylosanthes fruticosa, Tacca leontopetaloides, Tephrosia argyrotricha, T. ehrenbergiana, T. purpurea* var. *leptostachya*, and *Zornia glochidiata*, while the shade-loving grass *Megastachya mucronata* is a diagnostic species.

This is a vegetation type that restores relatively quickly after disturbances such as slash-and-burn agriculture, with prominent pioneer species including *Berlinia orientalis* (a vigorous resprouter), *Acacia quiterajoensis, Paropsia braunii, Ochna mossambicensis, Dichapetalum mossambicensis, Polysphaera multiflora* and *Xylopia collina.*

Abiotic environment and climate

Altitude range of 15 to 180 m asl with a mean of 74 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 67.8% while the similarly measured clay content is 18.9%. Soil pH is 5.9.

Precipitation during driest quarter is 30.5 mm.



Species of Conservation Importance

Endemic Plant Species

Bosqueiopsis carvalhoana, [NE], *Chassalia colorata* [E], *Crossopetalum mossambicense* [E], *Didymosalpinx callianthus* [NE], *Memecylon aenigmaticum* [E], *Orthosiphon scedastophyllus* [NE*], *Pavetta lindina* [E], *Polygala limae* [E], *Striga diversifolia* [E], *Vangueria domatiosa* [E].

Threatened Plant Species

Baphia macrocalyx [VU], *Chassalia colorata* [EN], *Crossopetalum mossambicense* [EN], *Didymosalpinx callianthus* [EN], *Garcinia acutifolia* [VU], *Memecylon aenigmaticum* [CR], *Monodora minor* [NT], *Orthosiphon scedastophyllus* [CR*], *Pavetta lindina* [EN], *Tricalysia semidecidua* [VU], *Uvaria kirkii* [NT], *Vangueria domatiosa* [EN], *Vismianthus punctatus* [VU], *Vepris sansibarensis* [VU], *Warneckea sousae* [NT], *Xylia africana* [EN], and *Xylopia collina* [NT].

Biogeographic Anomalies

Baphia punctulata subsp. *palmensis, Bosqueiopsis carvalhoana, Grewia conocarpa, Homalium longistylum, Maerua acuminata, Mimosa busseana, Phellocalyx vollesenii, Ritchiea capparoides* var. *capparoides, Triainolepis africana* subsp. *hildebrandtii.*

Photographic credits *left*: Palma area. photo: W. Mcleland *right*: Mocimboa da Praia to Palma. photo: M. Lotter

RLE Assessment

Assessment Summary	Assessment Information
This ecosystem has a restricted geographic distribution but there is little evidence of ongoing declines in extent. However, moderate degradation levels are present across most of the distribution of the ecosystem. **Vulnerable**	**Criterion A:** Expansion of urban areas, agriculture & deforestation has caused a 26.31% decline since 1750. Least Concern **Criterion B:** This ecosystem has an AOO of 55 10 x 10 km grid cells and an EOO of 5627.24 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern **Criterion C:** Not evaluated **Criterion D:** Degradation assessment shows that 43.21% of the current distribution faces >90 percent degradation severity, 68.85% of the distribution faces >70 percent degradation severity, and 93.29% of the distribution faces >50 percent degradation severity. Vulnerable **Criterion E:** Not evaluated

DOMBE ESCARPMENT MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Miombo da escarpa de Dombe
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Zambezian Wet Miombo

Description

Deciduous miombo woodland.

Distribution

Between Dombe and Inchope in Manica Province; also around Inhaunho in Sofala Province.

Characteristic native biota

The miombo component is made up of *Brachystegia boehmii, B. spiciformis,* and *Julbernardia globiflora,* while other trees are *Acacia sieberiana* var. *sieberiana, Albizia versicolor, Amblygonocarpus andongensis, Azanza garckeana, Berchemia discolor, Boscia salicifolia, Burkea africana, Crossopteryx febrifuga, Combretum adenogonium, C. molle, C. zeyheri, Dalbergia melanoxylon, Dalbergiella nyasae, Diospyros kirkii, Diplorhynchus condylocarpon, Entada abyssinica, Erythrina abyssinica, Erythrophleum africanum, Holarrhena pubescens, Lannea discolor, L. schweinfurthii, Lecaniodiscus fraxinifolius, Maprounea africana, Markhamia obtusifolia, Millettia stuhlmannii, Parinari curatellifolia, Pericopsis angolensis, Piliostigma thonningii, Pseudolachnostylis maprouneifolia, Psorospermum febrifugum, Pterocarpus angolensis, Sclerocarya birrea, Securidaca longepedunculata, Strychnos madagascariensis, Swartzia madagascariensis, Terminalia sericea, T. mollis, Uapaca spp.* (*U. kirkiana, U. sansibarica, U. nitida),* and *Xeroderris stuhlmannii.*

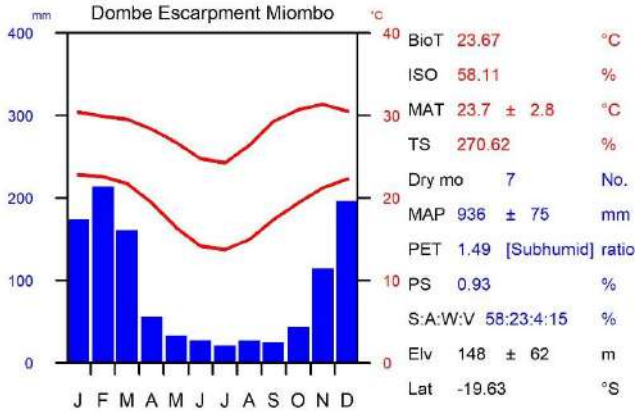
Some shrubs recorded are *Abutilon lauraster, Artabotrys brachypetalus, Bauhinia petersiana, Catunaregam taylorii, Friesodielsia obovata, Grewia inaequilatera, Hibiscus articulatus, Holarrhena pubescens, Phyllanthus mendoncae, Polysphaeria lanceolata, Rourea orientalis, Vangueria infausta,* and *Vitex doniana.*

Herbaceous species and grasses include *Crotalaria cephalotes, Echinochloa pyramidalis, Elionurus muticus, Eragrostis chapelieri, E. ciliaris, Hyparrhenia filipendula, Panicum deustum, P. maximum, Paspalum scrobiculatum, Rhynchosia sublobata*, *Stylochaeton borumensis, Themeda triandra,* and *Triumfetta annua.*

Abiotic environment and climate

Altitude range of 18 to 325 m asl with a mean of 148 m. S and content, expressed as % between 1 – 30 cm deep, is an estimated 69.5% while the similarly measured clay content is 17.4%. Soil pH is 6.1.

Precipitation during driest quarter is 39.2 mm.



Species of Conservation Importance

Endemic Plant Species

Cephalophis lukei [NE], *Coffea salvatrix* [E], *Cola clavata* [E], *Euphorbia crenata* [E], *Euphorbia neohalipedicola* [E].

Threatened Plant Species

Cephalophis lukei [EN], *Coffea salvatrix* [EN], *Cola clavata* [EN], *Euphorbia crenata* [DD].

RLE Assessment

Assessment Summary	Assessment Information
This ecosystem has a restricted geographic distribution but there is little evidence of ongoing declines in extent. However, moderate degradation levels are present across most of the distribution of the ecosystem. **Vulnerable**	**Criterion A:** Expansion of urban areas, agriculture & deforestation has caused a 29.6% decline since 1750. Least Concern **Criterion B:** This ecosystem has an AOO of 93 10 x 10 km grid cells and an EOO of 10541.31 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern **Criterion C:** Not evaluated **Criterion D:** Degradation assessment shows that 27.56% of the current distribution faces >90 percent degradation severity, 52.63% of the distribution faces >70 percent degradation severity, and 91.13% of the distribution faces >50 percent degradation severity. Vulnerable **Criterion E:** Not evaluated

GORONGOSA ESCARPMENT MOIST MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Miombo Humido da escarpa da Gorongosa
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Zambezian Wet Miombo

Description

A mixed semi-deciduous miombo woodland occurring on steep slopes with occasional rocky outcrops, well-watered on the southern and eastern slopes, drier on the northern slopes.

Distribution

Lower slopes of Gorongosa and Morrumbala mountains, although more surveys need to confirm Morrumbala's composition and affinities to other units as it may not be placed correctly. Occurring in Sofala and Zambezia Provinces.

Characteristic native biota

The trees are comprised of *Albizia adianthifolia, A. versicolor, Brachystegia microphylla, B. spiciformis, Bridelia micrantha, Burkea africana, Cussonia spicata, Entada abyssinica, Dalbergia nitidula, Englerophytum magalismontanum, Erythrina abyssinica, Erythrophleum suaveolens, Harungana madagascariensis, Heteropyxis dehniae, Maesa rufescens, Morella pilulifera, Parinari curatellifolia, Pericopsis angolensis, Protea* spp., *Pterocarpus angolensis, Securidaca longipedunculata, Syzygium cordatum, and Vitex doniana.*

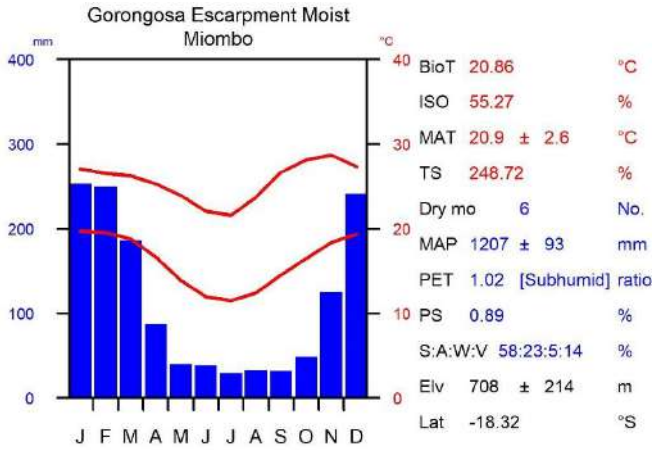
Typical small tree and shrub species recorded are *Aeschynomene nodulosa* var. *glabrescens, Annona senegalensis, Bauhinia galpinii, Erythroxylum emarginatum, Flemingia grahamiana, Psorospermum febrifugum, Rhoicissus tridentata, Smilax anceps, Tarenna pavettoides, Tephrosia aequilata* subsp. *mlanjeana, Tricalysia pallens, Vangueria apiculata and Vangueria infausta.*

Loudetia simplex, Melinis nerviglumis, Hyparrhenia variabilis, H. filipendula, Trachypogon spicatus, and *Themeda triandra* are the most common grass species. The herbaceous layer includes *Aspilia natalensis, Baccharoides calvoana, Dioscorea schimperiana, Gerbera viridifolia, Helichrysum quinquenerve, Lippia plicata, Pycnostachys orthodonta, and Smilax anceps.* The trees are often covered with epiphytes, mainly orchids and ferns and the conspicuous lichen *Usnea*.

Abiotic environment and climate

Altitude range of 385 to 1260 m asl with a mean of 708 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 49.0% while the similarly measured clay content is 31.5%. Soil pH is 5.9.

Precipitation during driest quarter is 87 mm.



Species of Conservation Importance: none recorded.

Photographic credits *Left* & *right*: lower slopes of Mt Gorongosa, Sofala Province. photos: M. Stalmans.

RLE Assessment

Assessment Summary

This ecosystem has faced significant historical declines, has a very restricted geographic distribution with evidence of continuing ongoing declines, and faces widespread degradation. **Endangered**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 50.66% decline since 1750. Vulnerable

Criterion B: This ecosystem has an AOO of 15 10 x 10 km grid cells and an EOO of 4078.6 km2. It has undergone substantial historical decline, and there is evidence that deforestation & other threats are leading to continuing decline. Endangered

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 32.22% of the current distribution faces >90 percent degradation severity, 70.5% of the distribution faces >70 percent degradation severity, and 98.67% of the distribution faces >50 percent degradation severity. Vulnerable

Criterion E: Not evaluated

GORONGOSA FOOTHILLS MOIST MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Miombo húmido do sopé da Gorongosa
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Zambezian Wet Miombo

Description

High-rainfall moist deciduous woodland at lower altitudes south of Gorongosa and extending up the Pungwe Valley. The terrain is comprised of rolling hills with generally narrowly incised drainage lines. This is a highly transformed landscape with extensive cultivation and charcoal production.

Distribution

Extending eastwards and southwards down from the flanks of Mt Gorongosa. Bound in the west by the moist miombo formations and on the east by the drier Rift Valley savanna vegetation. Occurring in Manica and Sofala Provinces.

Characteristic native biota

Woody species include *Brachystegia boehmii, B. spiciformis, Crossopteryx febrifuga, Diplorhynchus condylocarpon, Julbernardia globiflora, Pericopsis angolensis, Pterocarpus angolensis, P. rotundifolius* subsp. *rotundifolius, Sterculia quinqueloba, Strychnos potatorum,* with *Acacia nigrescens* on numerous dolerite dykes and termite mounds.

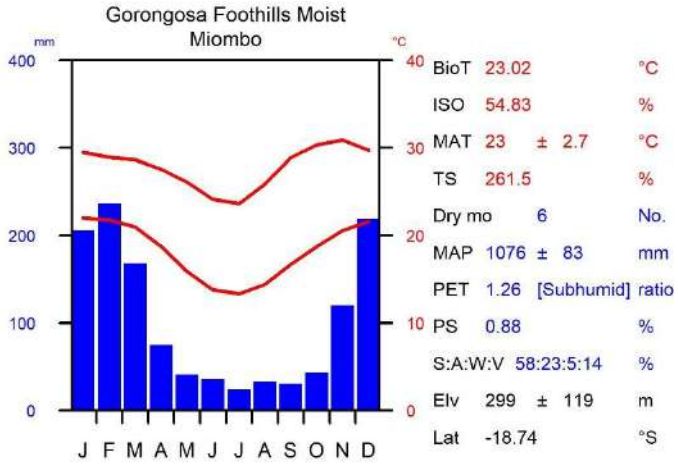
Grass species recorded are *Digitaria eriantha, Panicum maximum, Sporobolus* spp., *Themeda triandra,* with thickets of 2-5 m tall bamboo (*Oxytenanthera abyssinica*).

Riverine fringes harbour *Breonadia salicina*, *Khaya anthotheca*, *Sterculia appendiculata*, *Bombax rhodognaphalon* and *Phoenix reclinata*, with the grasses *Oplismenus* spp. and *Panicum maximum* in the understorey. The numerous termite mounds often support *Acacia nigrescens*, *Ziziphus mucronata*, and the grass *Cenchrus ciliaris*.

Abiotic environment and climate

Altitude range of 65 to 500 m asl with a mean of 299 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 66.0% while the similarly measured clay content is 20.4%. Soil pH is 6.0.

Precipitation during driest quarter is 67.7 mm.



Species of Conservation Importance: none recorded.

Photographic credits *Top*: foothills south-east of Mt Gorongosa. photo: J. Burrows; *bottom left*: Gorongosa National Park. photo: M. Stalmans; *bottom right*: between Rio Vunduzi and Gorongosa Mtn. photo: M. Stalmans.

RLE Assessment

Assessment Summary

This ecosystem has faced historical declines, has a very restricted geographic distribution, with evidence that deforestation & other threats are leading to continuing decline. **Endangered**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 33.2% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 61 10 x 10 km grid cells and an EOO of 5568.21 km2. It has undergone historical decline, and there is evidence that deforestation & other threats are leading to continuing decline. Endangered

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 33.13% of the current distribution faces >90 percent degradation severity, 56.86% of the distribution faces >70 percent degradation severity, and 93.39% of the distribution faces >50 percent degradation severity. Vulnerable

Criterion E: Not evaluated

GURUE PLATEAU MOIST MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Miombo húmido do planalto de Gurue
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Zambezian Wet Miombo

Description

Moist deciduous miombo woodland on the high-lying Gurue plateau, above 700 m in altitude.

Distribution

On the Gurue plateau in northern Mozambique, from Jumbe in the west, to just above Malema in the east. Occurring in Nampula, Niassa, and Zambezia Provinces. Also in Malawi.

Characteristic native biota

A miombo unit dominated by *Brachystegia spiciformis, B. boehmii, B. longifolia, B. manga, B. utilis*, and *Julbernardia globiflora*. Associated other tree species are *Acacia goetzei* subsp. *goetzei, A. karroo, A. polyacantha* subsp. *campylacantha, A. sieberiana* var. *woodii, Albizia adianthifolia, A. versicolor, Amblygonocarpus andongensis, Burkea africana, Cassia abbreviata* subsp. *beareana, Combretum molle, Dalbergia boehmii, D. nitidula, Diospyros kirkii, Diplorhynchus condylocarpon, Dombeya rotundifolia, Entada abyssinica, Erythrophleum africanum, Ficus sycomorus* subsp. *gnaphalocarpa, Millettia usaramensis* subsp. *australis, Parinari curatellifolia, Pericopsis angolensis, Phyllocosmus lemaireanus, Pteleopsis myrtifolia, Pterocarpus angolensis, P. rotundifolius* subsp. *polyanthus, Strychnos madagascariensis, Swartzia madagascariensis, Terminalia brachystemma, Trichilia emetica, Uapaca kirkiana, U. nitida*, and *Xeroderris stuhlmannii.*

Small trees and woody shrubs recorded are *Abrus schimperi* subsp. *africanus, Annona senegalensis, Cryptosepalum maraviense, Dalbergia melanoxylon, Dalbergiella nyassae, Dichrostachys cinerea* subsp. *nyassana, Diospyros squarrosa, Dissotis princeps, Dodonaea viscosa, Heteromorpha arborescens* subsp. *abyssinica, Maprounea africana, Protea angolensis* subsp. *divaricata, Pterolobium stellatum,* and *Searsia longipes.*

Softer shrubs and herbaceous species include *Bidens steppia, Centemopsis conferta, Crassocephalum picridifolium, Crotalaria laburnoides, Desmodium barbatum var. dimorphum, Eriosema ellipticum, Gonatopus boivinii, Haumaniastrum venosum, Helichrysum kirkii, Hibiscus surattensis, Indigofera rhynchocarpa, Kotschya strigosa, Nesaea radicans* var. *floribunda, Rhynchosia divaricata, Tephrosia decora, T. elata* subsp. *heckmanniana, T. vogelii,* and *Vernoniastrum acuminatissimum.*

Climbers noted are *Dioscorea quartiniana, Mucuna pruriens* and *Pergularia daemia* subsp. *daemia*.

The few grasses recorded are *Cenchrus polystachios, Cymbopogon densiflorus, Eragrostis cilianensis, Heteropogon contortus, Ischaemum afrum, Panicum frederici*, and *P. trichocladum.*

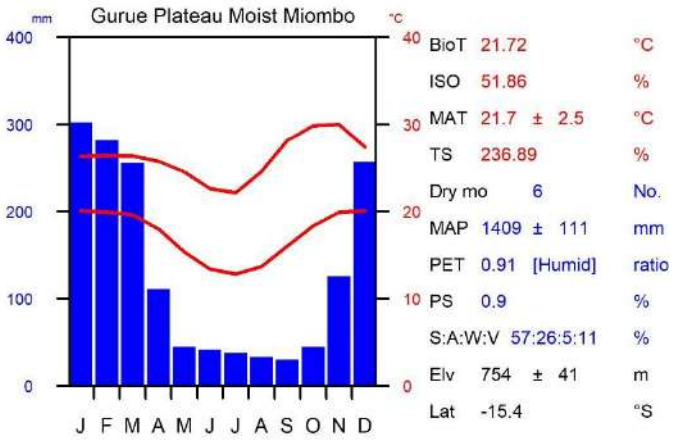
Trees and shrubs recorded from riparian forest (part of the Lurio Riparian Forest type) are *Albizia glaberrima* subsp. *glabrescens, Breonadia salicina, Cola greenwayi, Craterispermum schweinfurthii, Erythroxylum emarginatum, Homalium africanum, Khaya anthotheca, Mascarenhasia arborescens, Monanthotaxis buchananii, Philenoptera violacea, Prunus africana, Syzygium cordatum*, and *Vitex doniana*, with lianes and creepers such as *Dalbergia fischeri, D. lactea, Millettia lasiantha*, and *Mucuna poggei* var. *pesa.*

Species recorded from the rock outcrops and rocky hills are *Aloe chabaudii, A. menyharthii* subsp. *ensifolia, Brachystegia bussei, B. microphylla, Euphorbia matabelensis, E. mlanjeana, Kalanchoe elizae, Xerophyta suaveolens* var. *vestita.*

Abiotic environment and climate

Altitude range of 700 to 870 m asl with a mean of 754 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 66.9% while the similarly measured clay content is 20.6%. Soil pH is 5.8.

Precipitation during driest quarter is 57.2 mm.



Species of Conservation Importance

Endemic Plant Species

Ammannia parvula [E], *Cynanchum oresbium* [E], *Digitaria megasthenes* [E].

Threatened Plant Species

Ammannia parvula [VU], *Cynanchum oresbium* [VU], *Digitaria megasthenes* [EN].

RLE Assessment

Assessment Summary

This ecosystem has declined by more than 69% since 1750 due to expansion of agriculture, urban areas and deforestation. **Vulnerable**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 69.08% decline since 1750. Vulnerable

Criterion B: This ecosystem has an AOO of 148 10 x 10 km grid cells and an EOO of 18347.54 km2. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.77% of the current distribution faces >90 percent degradation severity, 8.54% of the distribution faces >70 percent degradation severity, and 74.79% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

LAKE NIASSA LOWLAND MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Miombo das terras baixas do Lago Niassa

Biome Savannas and grasslands (T4)

Functional group Pyric tussock savannas (T4.2)

Regional Ecosystem Zambezian Wet Miombo

Description

Moist deciduous miombo woodland. Landscape flat to undulating.

Distribution

Lowland areas between Lake Niassa and the escarpment in Niassa Province.

Characteristic native biota

Major tree species include *Acacia goetzei* subsp. *microphylla, A. nigrescens, A. nilotica* subsp. *kraussiana, A. polyacantha* subsp. *campylacantha, A. robusta* subsp. *usambarensis, Adansonia digitata, Afzelia quanzensis, Albizia glaberrima* subsp. *glabrescens, A. versicolor, Brachystegia manga, Combretum adenogonium, C. imberbe, Cordyla africana, Faidherbia albida, Ficus sycomorus* subsp. *gnaphalocarpa, Julbernardia globiflora, Kigelia africana, Monotes engleri, Pericopsis angolensis, Philenoptera violacea, Pterocarpus angolensis, Sclerocarya birrea* subsp. *caffra, Sterculia appendiculata, Tamarindus indica* and *Trichilia emetica.*

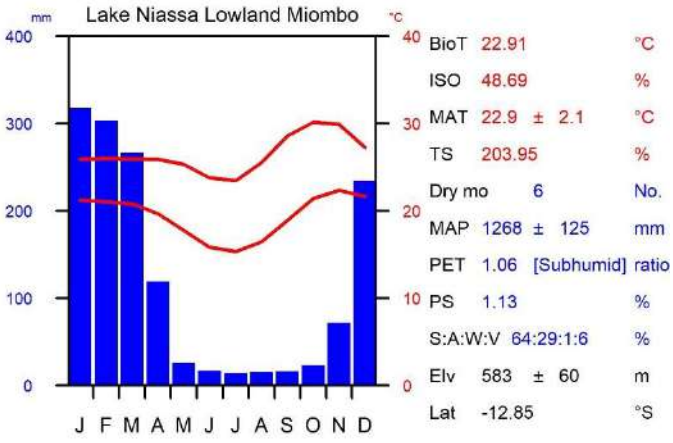
Small trees and large shrubs include *Albizia anthelmintica, Annona senegalensis, Calotropis procera, Capparis erythrocarpos, Cladostemon kirkii, Dalbergia arbutifolia, D. melanoxylon, Dichrostachys cinerea* subsp. *nyassana, Maerua angolensis, M. parvifolia, Olax dissitiflora* and *Sesbania macrantha.* Softer shrubs include *Crotalaria calycina, C. lachnophora, Eriosema psoraleoides, Eminia antennulifera, Hibiscus diversifolius* and *Tephrosia rhodesica* var. *rhodesica.*

At higher altitudes as one ascends towards the escarpment occur *Diplorhynchus condylocarpon, Kirkia acuminata, Piliostigma thonningii, Sterculia quinqueloba, Vitex mombassae, V. payos* var. *glabrescens* and the bamboo *Oxytenanthera abyssinica* become dominant, with smaller species such as *Annona senegalensis, Baccharoides calvoana* subsp. *meridionalis, Gardenia ternifolia* subsp. *jovis-tonantis* and *Pavetta crassipes*.

Abiotic environment and climate

Altitude range of 475 to 730 m asl with a mean of 583 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 59.8% while the similarly measured clay content is 24.5. Soil pH is 6.0.

Precipitation during driest quarter is 5.4 mm.



Species of Conservation Importance: none recorded.

Photographic credits *Top*: *Pericopsis angolensis* in Lake Niassa Lowland Miombo, near Likomo, Niassa Province: photo: M. Lotter; *bottom*: *Monotes engleri* opposite Likomo Island, Niassa Province. photo: J. Burrows.

RLE Assessment

Assessment Summary

This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 16.82% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 51 10 x 10 km grid cells and an EOO of 7759.19 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.24% of the current distribution faces >90 percent degradation severity, 3.04% of the distribution faces >70 percent degradation severity, and 23.18% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

LICHINGA ESCARPMENT MOIST MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Miombo húmido da escarpa de Lichinga
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Zambezian Wet Miombo

Description

Deciduous moist miombo woodland along the escarpment area of the Lichinga plateau.

Distribution

Fringing the Lichinga escarpment area in Niassa Province, also in Malawi.

Characteristic native biota

Brachystegia microphylla is dominant on steep slopes and high ground with other characteristic trees being *Brachystegia boehmii, B. spiciformis, Acacia amythethophylla, A. goetzei* subsp. *microphylla, A. lasiopetala, Bersama abyssinica, Boscia salicifolia, Cordia mukuensis, Commiphora africana, Diplorhynchus condylocarpon, Elaeodendron buchananii, Euclea natalensis, Faurea saligna, Harrisonia abyssinica, Heteropyxis dehniae, Hirtella zanzibarica, Hymenodictyon floribundum, Lannea discolor, Ozoroa reticulata, Phyllanthus beillei, Pterocarpus angolensis, Sclerocroton integerrimus, Sterculia quinqueloba, Terminalia stenostachya, Uapaca kirkiana , U. nitida*, and *Vitex doniana.*

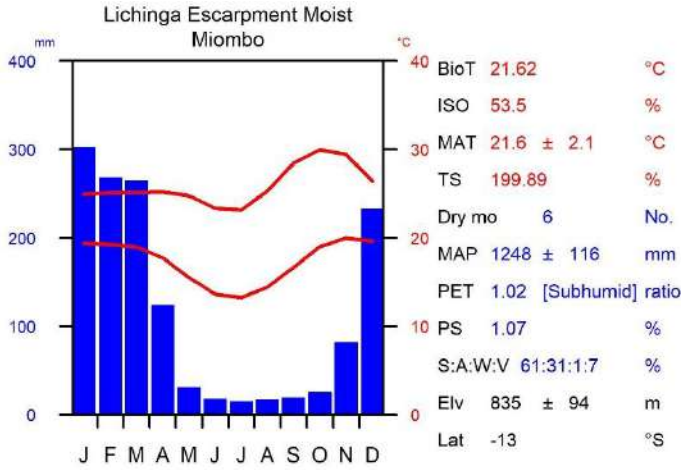
Small trees and woody shrubs include *Allophylus congolanus, Bridelia cathartica, Clerodendrum robustum, Deinbollia borbonica, Dombeya acutangula, Grewia herbacea, Pavetta crassipes, Protea angolensis* var. *divaricata,* and *Tapiphyllum cinerascens.* Small shrubs are *Aeschynomene abyssinica, A. pawekiae, Droogmansia pteropus, Eriosema ellipticum, Helichrysum odoratissimum, Sesbania sesban.* The ground layer includes *Cryptosepalum maraviense, Pavetta decumbens, Pelargonium luridum, Plectranthus densus* and *Siphonochilus aethiopicus.*

Moist gullies and stream margins have more forest elements such as *Albizia adianthifolia, Antidesma venosum, Craterispermum schweinfurthii, Croton sylvaticus, Ixora narcissodora, Khaya anthotheca, Parinari excelsa, Parkia filicoidea, Pittosporum viridiflorum, Psychotria linearisepala, Scolopia stolzii, Sericanthe andongensis* subsp. *andongensis, Solanecio mannii, Tinnea aethiopica* subsp. *stolzii,* and *Uapaca lissopyrena.*

Abiotic environment and climate

Altitude range of 650 to 1020 m asl with a mean of 835 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 59.9% while the similarly measured clay content is 25.4%. Soil pH is 5.7.

Precipitation during driest quarter is 6.6 mm.



Species of Conservation Importance

Endemic Plant Species

Aeschynomene pawekiae [NE], *Barleria fulvostellata* subsp. *mangochiensis* [NE*], *Cordia mandimbana* [E].

Threatened Plant Species

Barleria fulvostellata subsp. *mangochiensis* [EN*], *Cordia mandimbana* [DD].

Photographic credits *Top*: Lake Niassa escarpment, Manda Wilderness Area, Metangula. photo: J. Burrows; *bottom*: Lake Niassa escarpment west of Lichinga. Photo: S. Hardy.

RLE Assessment

Assessment Summary

This ecosystem has a restricted geographic distribution but there is little evidence of ongoing declines in extent. However, moderate degradation levels are present across most of the distribution of the ecosystem. **Vulnerable**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 14.63% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 318 10 x 10 km grid cells and an EOO of 56592.91 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 13.21% of the current distribution faces >90 percent degradation severity, 21.54% of the distribution faces >70 percent degradation severity, and 93.25% of the distribution faces >50 percent degradation severity. Vulnerable

Criterion E: Not evaluated

LICHINGA MONTANE MOIST MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Miombo húmido de montanha de Lichinga
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Zambezian Wet Miombo

Description

Deciduous or semi-deciduous moist miombo above 1000 m in altitude.

Distribution

Fringing the Lichinga escarpment area in Niassa Province; also in Malawi.

Characteristic native biota

The miombo woodland is dominated by *Brachystegia spiciformis, B. utilis, B. boehmii, Julbernardia globiflora*, with *Acacia abyssinica, A. amythethophylla, Combretum molle, Cussonia arborea, Dalbergia nitidula, Dichrostachys cinerea, Diplorhynchus condylocarpon, Entada abyssinica, Euclea schimperi, Faurea saligna, F. rochetiana, Ficus ovata, Monotes africanus, Ozoroa reticulata, Parinari curatellifolia, Pavetta crassipes, Pericopsis angolensis, Piliostigma thonningii, Protea angolensis* var. *divaricata, P. gaguedi, P. madiensis* subsp. *madiensis, P. petiolaris, P. welwitschii, Pterocarpus angolensis, Rotheca myricoides* subsp. *myricoides* var. *discolor, Sericanthe andongensis* var. *andongensis, Swartzia madagascariensis, Syzygium pratense. Terminalia sericea, T. stenostachya, Uapaca kirkiana, U. sansibarica, Vitex buchananii, and V. mombassae.*

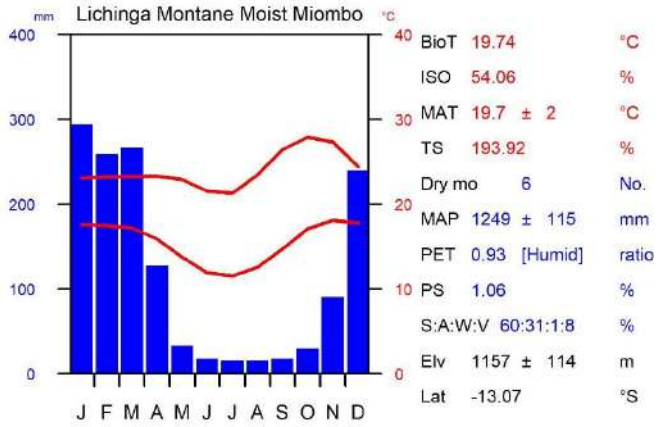
Shrub layer with *Cleome hirta, Clerodendrum robustum, Diospyros lycioides* subsp. *lycioides, D. zombensis, Droogmansia pteropus, Erica benguelensis, Indigofera emarginella* var. *emarginella, Kotschya strigosa, Multidentia crassa, Psychotria mahonii,* and *Rytigynia macrura.* The herbaceous layer has *Asparagus flagellaris, A. saundersiae, Commelina aspera, Heteromorpha stenophylla, Hyparrhenia filipendula, Panicum* spp., *Themeda triandra,* and *Urochloa* spp., At lower elevations, at the base of the plateau, the endemic shrub *Barleria torrei* grows in open woodland.

Riparian forest grows along the stream gullies that drain from the plateau. *Albizia gummifera* is the dominant tree species, growing with *Antidesma venosum, Breonadia salicina, Heteromorpha arborescens* var. *abyssinica, Ixora narcissodora, Keetia gueinzii, Mimusops zeyheri, Pavetta guruensis, Rauvolfia caffra, Schrebera alata* and *Zanthoxylum* sp. Where the canopy is more open occur *Dracaena steudneri, Solanecio mannii* and tree ferns (*Cyathea* spp.).

Abiotic environment and climate

Altitude range of 1000 to 1480 m asl with a mean of 1157 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 55.4% while the similarly measured clay content is 28.5%. Soil pH is 5.7.

Precipitation during driest quarter is 7.8 mm.



Species of Conservation Importance

Endemic Plant Species

Barleria torrei [E], *Blepharis torrei* [NE], *Hibiscus torrei* [E], *Moraea niassensis* [E*], *Streptocarpus erubescens* [NE*].

Threatened Plant Species

Barleria torrei [EN], *Gladiolus zambesiacus* [VU], *Hibiscus torrei* [EN], *Moraea niassensis* [VU*], *Oncella curviramea* [VU], *Streptocarpus erubescens* [EN*].

Biogeographic Anomalies

Diospyros zombensis, *Ficus ovata.*

Photographic credits *Top*: south of Lichinga, Niassa Province. photo: J. Burrows; *bottom*: Lichinga to Sanga, Niassa Province. photo: M. Lotter.

RLE Assessment

Assessment Summary

This ecosystem has undergone historical decline, and there is evidence that climate change will greatly reduce climatically suitable area in the future. **Endangered**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 42.28% decline since 1750, and this ecosystem is assessed as Least Concern under A3. Future climate models predict declines in suitable climate of 66-88% between 2000 & 2050. As such this ecosystems is assessed as Endangered under A2a, with plausible bounds of Endangered – Critically Endangered.

Criterion B: This ecosystem has an AOO of 174 10 x 10 km grid cells and an EOO of 34479.62 km2. It has undergone historical decline, and there is evidence that deforestation & other threats are leading to continuing decline. Vulnerable

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.96% of the current distribution faces >90 percent degradation severity, 4.52% of the distribution faces >70 percent degradation severity, and 44.62% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

LUPILICHI ESCARPMENT MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Miombo da escarpa de Lupilichi

Biome Savannas and grasslands (T4)

Functional group Pyric tussock savannas (T4.2)

Regional Ecosystem Zambezian Wet Miombo

Description

Moist deciduous miombo woodland.

Distribution

In northern Mozambique, between the Rovuma River and Lake Niassa. Occurring in Niassa Province. Extending into Tanzania.

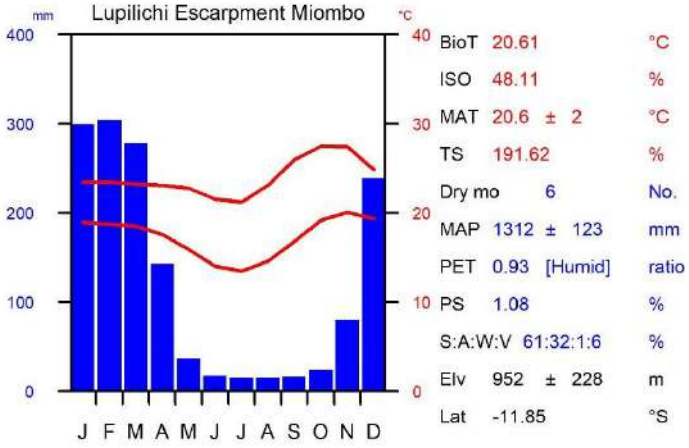
Characteristic native biota

There is very little data relating to the species composition of this vegetation type. From our recorded observations, the miombo is dominated by *Brachystegia spiciformis, B. boehmii, B. bussei, B. allenii, B. manga, B. longifolia* and *Julbernardia globiflora*, with *Burkea africana, Diplorhynchus condylocarpon, Faurea rochetiana, Margaritaria discoidea* var. *triplosphaera, Monotes africanus, M. engleri, Parinari curatellifolia, Pericopsis angolensis, Protea rupestris, Pterocarpus angolensis* and *Uapaca nitida. Uapaca kirkiana is* often among the dominant species, in places forming dense, monospecific stands. The shrubs *Aeschynomene grandistipulata, Droogmansia pteropus* and *Cryptosepalum maraviense* are also recorded.

Abiotic environment and climate

Altitude range of 550 to 1369 m asl with a mean of 952 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 49.0% while the similarly measured clay content is 32.2%. Soil pH is 5.6.

Precipitation during driest quarter is 11.1 mm.



Species of Conservation Importance: none recorded.

Photographic credits Woodland in the Lago District mountains, Niassa Province. photo: J. Osborne.

RLE Assessment

Assessment Summary

This ecosystem has a restricted geographic distribution but there is little evidence of ongoing declines in extent. However, moderate degradation levels are present across most of the distribution of the ecosystem. **Vulnerable**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 4.8% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 24 10 x 10 km grid cells and an EOO of 2018.98 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.27% of the current distribution faces >90 percent degradation severity, 7.43% of the distribution faces >70 percent degradation severity, and 98.82% of the distribution faces >50 percent degradation severity. Vulnerable

Criterion E: Not evaluated

MABU MOIST MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Miombo húmido de Mabu
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Zambezian Wet Miombo

Description

Moist deciduous miombo woodland occurring in high-rainfall areas of the Mabu Plateau.

Distribution

On the Mabu Plateau in Zambezia Province. Also in Malawi.

Characteristic native biota

The miombo woodlands are dominated *by Brachystegia spiciformis, B. boehmii, B. longifolia, B. manga, B. utilis and Julbernardia globiflora*. Other trees recorded are *Acacia amythethophylla, A. goetzei* subsp. *goetzei* and subsp. *microphylla, A. polyacantha* subsp. *campylacantha, A. sieberiana* var. *woodii, Albizia adianthifolia, A. antunesiana, A. versicolor, Amblygonocarpus andongensis, Boscia salicifolia, Brackenridgea zanguebarica, Bridelia duvigneaudii, Burkea africana, Cassia abbreviata* subsp. *beareana, Cleistochlamys kirkii, Combretum adenogonium, C. collinum, C. molle, C. zeyheri, Commiphora serrata, Crossopteryx febrifuga, Cussonia arborea, Dalbergia boehmii, D. melanoxylon, D. nitidula, Diplorhynchus condylocarpon, Dombeya rotundifolia, D. shupangae, Elaeodendron schlechterianum, Entada abyssinica, Erythrophleum africanum, Faurea rochetiana, Ficus lutea, F. petersii, F. sycomorus* subsp. *gnaphalocarpa, Holarrhena pubescens, Markhamia obtusifolia, Millettia stuhlmannii, M. usaramensis* subsp. *australis, Olax dissitiflora, Parinari curatellifolia, Pericopsis angolensis, Philenoptera bussei, Piliostigma thonningii, Pseudolachnostylis maprouneifolia, Pterocarpus angolensis, P. rotundifolius* subsp. *polyanthus, Sclerocarya birrea* subsp. *caffra, Steganotaenia araliacea, Stereospermum kunthianum, Swartzia madagascariensis, Syzygium guineense* subsp. *guineense, Terminalia stenostachya, Uapaca kirkiana, U. nitida, U. sansibarica, Vitex doniana*, and *Xeroderris stuhlmannii.*

Small trees and woody shrubs are *Bauhinia petersiana, Bridelia cathartica* subsp. *melanthioides* f. *fischeri, Dalbergiella nyassae, Dichrostachys cinerea* subsp. *nyassana, Diospyros lycioides* subsp. *sericea, D. squarrosa, Dodonaea viscosa, Elephantorrhiza goetzei* subsp. *goetzei, Euclea natalensis* subsp. *obovata, Flacourtia indica, Gardenia ternifolia* var. *jovis-tonantis, Grewia micrantha, Gymnosporia senegalensis, Hymenocardia acida, Leptactina delagoensis* subsp. *delagoensis, Maprounea africana, Ormocarpum kirkii, Pavetta crassipes, Protea madiensis* subsp. *madiensis, Psorospermum febrifugum, Rotheca myricoides* subsp. *discolor, Rothmannia engleriana, Rourea orientalis, Rytigynia celastroides* var. *celastroides, R. decussata, Searsia longipes, Securidaca longepedunculata, Senna petersiana, Tricalysia coriacea* subsp. *nyassae, Vangueria infausta, Vitex mombassae, V. payos* var. *payos,* and *Ximenia caffra* var. *natalensis.*

Small shrubs and herbaceous species include *Aeschynomene abyssinica, A. minutiflora* subsp. *grandiflora, A. nyassana, A. schimperi, Ampelocissus obtusata* subsp. *kirkiana, Anisopappus chinensis* var. *dentatus, Asparagus flagellaris, A. migeodii, A. racemosus, Cayratia gracilis, Chamaecrista comosa, Cissus bathyrhakodes, C. petiolata, Clematis villosa* subsp. *villosa, Cordylostigma longifolium, Costus macranthus, Crotalaria capensis, C. cephalotes, C. hyssopifolia, C. laburnoides, C. lanceolata, C. mocubensis, C. natalitia, C. uncinella, C. vasculosa, C. virgulata* subsp. *forbesii, Crossandra puberula, C. pyrophila, Cucumis hirsutus, Cyphostemma gigantophyllum, C. glandulosissimum, C. junceum, C. lynesii, Decorsea schlechteri, Dolichos sericeus* subsp. *formosus, Eulophia cucullata, E. livingstoneana, E. speciosa, Euphorbia systyloides* var. *porcaticapsa, E. zambesiana* var. *zambesiana, Fadogia ancylantha, Flemingia grahamiana, Gladiolus crassifolius, G. dalenii, Gloriosa superba, Glossostelma cabrae, Hibiscus engleri, H. fuscus, H. physaloides,*

Indigofera garckeana, I. subcorymbosa, I. zenkeri, Justicia striata var. *striata, Margaretta rosea* subsp. *whytei, Nervilia renschii, Oxalis semiloba* subsp. *uhehensis, Polygala sadebeckiana, P. stenopetala, Pseudarthria hookeri, Pseudoeriosema andongense* subsp. *andongense, Pteridium aquilinum, Pterococcus africanus, Rhinacanthus zambesiacus, Rhynchosia divaricata, R. luteola* var. *luteola, Siphonochilus aethiopicus, S. kirkii, Solanum zanzibarense* var. *vagans, Tacca leontopetaloides, Tephrosia decora, T. linearis, T. nana, T. reptans, T. rhodesiaca, T. stormsii, Thunbergia lancifolia, Triumfetta dekindtiana, Urena lobata*, and *Vernoniastrum acuminatissimum.*

Grasses recorded are *Alloteropsis semialata, Andropogon schirensis, Aristida diminuta, Chloris pycnothrix, Cleistachne sorghoides, Coelorachis lepidura, Craspedorhachis africana, Diandrochloa namaquensis, Digitaria gazensis, Diheteropogon amplectens* var. *catangensis, Elymandra grallata, Eragrostis ciliaris, E. nindensis, Eriochloa rovumensis, Hackelochloa granularis, Hyparrhenia filipendula, H. rufa, H. variabilis, H. welwitschii, Hyperthelia dissoluta, Leersia hexandra, Loudetia arundinacea, L. phragmitoides, L. simplex, Melinis nerviglumis, Panicum gracilicaule, P. laticomum, P. maximum, P. tenellum, P. trichocladum, Paspalum scrobiculatum, Pennisetum glaucum, P. unisetum, Sacciolepis curvata, S. spiciformis, Sporobolus pyramidalis, S. sanguineus, Stereochlaena cameronii,* and *Tristachya superba.*

Climbers include *Adenia lobata* subsp. *rumicifolia, Artabotrys brachypetalus, Dalbergia arbutifolia, D. fischeri, D. lactea, Dioscorea prehensilis, Mucuna coriacea* subsp. *irritans, Sarcostemma viminale, Smilax anceps*, and *Stictocardia laxiflora* var. *laxiflora.* Geoxylic suffrutices (underground trees) recorded are *Cryptosepalum maraviense, Gymnosporia gurueensis, Lannea edulis, Leptactina benguelensis,* and *Ochna leptoclada*.

Scattered patches of thick forest-like vegetation are composed of *Albizia adianthifolia, Allophylus africanus, Annona senegalensis, Bersama abyssinica* subsp. *abyssinica, Coffea zanguebariae, Cola mossambicensis, Ekebergia capensis, Heinsia crinita* subsp. *parviflora, Heteromorpha arborescens* var. *abyssinica, Hugonia orientalis, Keetia venosa, Margaritaria discoidea* var. *fagifolia, Monanthotaxis buchananii, Pavetta gardeniifolia, Psychotria kirkii, Pteleopsis myrtifolia, Synaptolepis alternifolia,* and *Trema orientalis.*

Riparian forest is typically composed of *Acacia schweinfurthii, Albizia glaberrima* var. *glabrescens, Antidesma venosum, Breonadia salicina, Canarium madagascariense* (Mocuba–Alto Molocue area), *Dombeya burgessiae, Entada rheedii* (liane), *Erythrophleum suaveolens, Erythroxylum emarginatum, Ficus trichopoda, Homalium africanum, Ixora narcissodora, Khaya anthotheca, Parinari excelsa, Philenoptera violacea, Phoenix reclinata, Polysphaeria lanceolata, Psydrax kraussioides, Saba comorensis* (liane), *Sterculia appendiculata, Strychnos angolensis* (liane), *Synsepalum brevipes, S. passargei, Syzygium cordatum, Tinnea aethiopica* subsp. *stolzii, Toddalia asiatica* (liane), *Treculia africana, Trichilia emetica*, and *Zanha golungensis.*

Throughout the area, and particularly in the area around Errego, are numerous rocky outcrops or bare rocky hills, the larger of which grade into inselbergs (see also Northern Inselberg Woodland). These rocky areas support a distinct array of plants including trees and shrubs such as *Afzelia quanzensis, Brachystegia bussei, B. microphylla, Euphorbia griseola* subsp. *mashonica, E. matabelensis, E. tirucalli, Ficus glumosa, Pouzolzia mixta, Searsia*

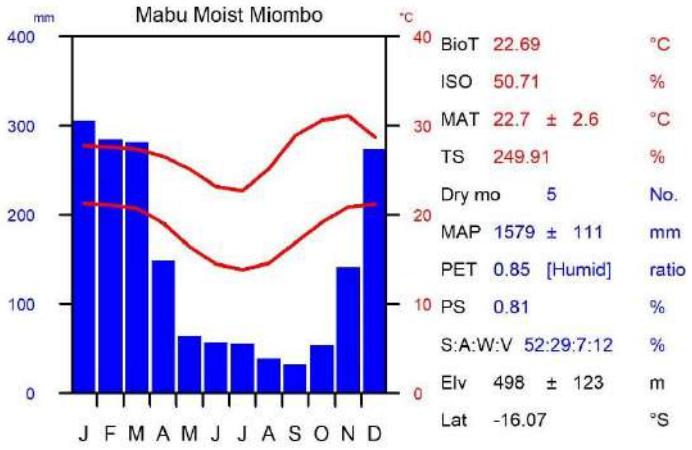
acuminatissima, Sterculia quinqueloba, and Strophanthus hypoleucus. Small shrubs and herbaceous plants include *Actiniopteris dimorpha, Aloe chabaudii, A. mawii, Asplenium stuhlmannii, Cheilanthes leachii, C. viridis* var. *glauca, Coleochloa pallidior, Huernia erectiloba, Kalanchoe hametiorum, K. humilis, Myrothamnus flabellifolius, Pellaea calomelanos* var. *calomelanos, P. pectiniformis, Plectranthus sanguineus, Polystachya dendrobiiflora, Selaginella njamnjamensis, Xerophyta* spp. Thin soils in seasonally wet depressions in the rock support herbaceous species such as *Aeollanthus serpiculoides, Aristida diminuta, Bulbostylis burchellii, Drosera indica, Eriocaulon transvaalicum* subsp. *hanningtonii, Eriospermum* spp., *Lindernia exilis, Oldenlandia verrucitesta, Utricularia formula,* and *Xyris rubella.*

In gulley's between the hills or around the base of rocky outcrops, water run-off supports a moist forest typically composed of *Albizia gummifera, Blighia unijugata, Craterispermum schweinfurthii, Diospyros natalensis, Dracaena mannii, Garcinia buchananii, Harungana madagascariensis, Hirtella zanzibarica, Mascarenhasia arborescens, Mussaenda arcuata, Psychotria capensis* subsp. *capensis, Rothmannia manganjae, Schrebera trichoclada, Sorindeia madagascariensis, Synsepalum cerasiferum, Tarenna pavettoides* subsp. *affinis*, among others.

Abiotic environment and climate

Altitude range of 255 to 705 m asl with a mean of 498 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 64.1% while the similarly measured clay content is 22.8%. Soil pH is 5.8.

Precipitation during driest quarter is 82.9 mm.



Species of Conservation Importance

Endemic Plant Species

Oldenlandia verrucitesta [E].

Biogeographic Anomalies

Canarium madagascariense, Euphorbia systyloides var. *porcaticapsa, Glossostelma cabrae, Gymnosporia gurueensis.*

Photographic credits *Left*: Errego, Ile District, Zambezia Province. photo: J. Burrows; *right*: near Ile, Zambezia Province. photo: M. Lotter.

RLE Assessment

Assessment Summary

This ecosystem has undergone substantial historical decline, and there is evidence that deforestation & other threats are leading to continuing decline. **Vulnerable**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 49.72% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 294 10 x 10 km grid cells and an EOO of 32072.29 km2. It has undergone substantial historical decline, and there is evidence that deforestation & other threats are leading to continuing decline. Vulnerable

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.01% of the current distribution faces >90 percent degradation severity, 1.28% of the distribution faces >70 percent degradation severity, and 24.2% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

MACANGA MONTANE MOIST MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Miombo húmido de montanha de Macanga

Biome Savannas and grasslands (T4)

Functional group Pyric tussock savannas (T4.2)

Regional Ecosystem Zambezian Wet Miombo

Description

Moist deciduous miombo woodland above 1000 m in elevation.

Distribution

In north-western corner of Mozambique, along the Angonia Plateau between Zambia and Malawi (Tete Province), extending into both countries.

Characteristic native biota

The trees are dominated by miombo species *Brachystegia spiciformis, B. longifolia, B. stipulata, B. floribunda, B. utilis, Julbernardia globiflora,* and *J. paniculata,* with the addition of *Anisophyllea boehmii, Bersama abyssinica* subsp. *engleriana, Fagaropsis angolensis var. mollis, Monotes engleriana, Parinari curatellifolia, Pericopsis angolensis, Pterocarpus rotundifolius* subsp. *rotundifolius, Scolopia stolzii, Swartzia madagascariensis, Uapaca kirkiana, U. sansibarica,* and *Vitex doniana.*

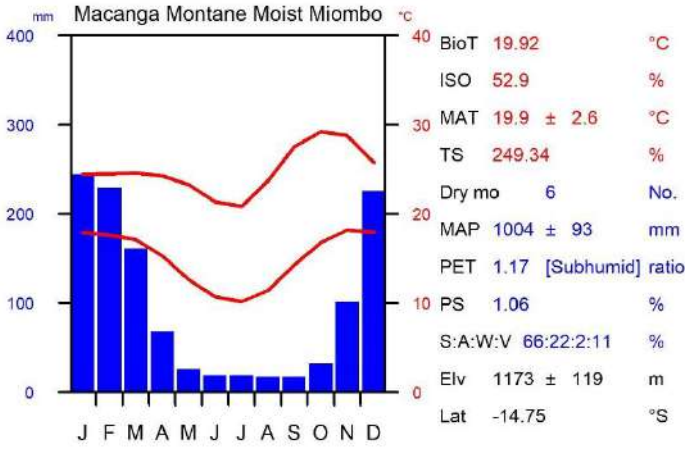
Small trees and shrubs with *Afrocanthium lactescens*, *Diospyros zombensis, Erica benguellensis, Flacourtia indica, Gymnanthemum bellinghamii, Protea gaguedi, Psorospermum febrifugum, Psychotria eminiana, Solanum chrystotrichum, Syzygium pratense, Tapiphyllum velutinum,* and *Tricalysia coriacea subsp. nyassae*.

The ground flora is composed of, among others, *Annona stenophylla, Asparagus flagellaris, Crotalaria lachnophora, Cryptosepalum maraviense, Dolichos kilimandscharicus, Eulophia longisepala, Floscopa glomerata* (wet areas), *Galium bussei* var. *glabrostrictius, Gardenia subacaulis, Kotschya strobilantha, K. speciosa, Rotheca luembensis* subsp. *luembensis, Sphenostylis erects* subsp. *erecta,* and *Vitex madiensis* subsp. *milanjiensis.* The riverine vegetation is characterized by *Breonadia salicina, Cassipourea ellipticus* subsp. *malosanus, Dissotis princeps* var. *candolleanum, Faurea delevoyi, Ficus verruculosa, Gardenia imperialis, Psydrax kraussioides, Phyllanthus muellerianus, Maesa angolensis, Raphia farinifera,* and *Syzygium cordatum.*

Abiotic environment and climate

Altitude range of 1000 to 1500 m asl with a mean of 1173 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 68.5% while the similarly measured clay content is 19.4%. Soil pH is 5.7.

Precipitation during driest quarter is 15.1 mm.



Species of Conservation Importance

Biogeographic Anomalies

Anisophyllea boehmii, Brachystegia stipulata, Maesa angolensis, Phyllanthus muellerianus.

Photographic credits *Left*: *Brachystegia stipulata* miombo woodland, and *right*: *Julbernardia paniculata* miombo woodland, both Angonia Plateau, Tete Province. photos: J. Burrows.

RLE Assessment

Assessment Summary

This ecosystem has a restricted distribution, and there is evidence that climate change will greatly reduce climatically suitable area in the future. **Endangered.**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 44.81% decline since 1750, and this ecosystem is assessed as Least Concern under A3. However, future climate models predict declines in suitable climate of 74-91% between 2000 & 2050. As such this ecosystem is assessed as Endangered under A2a, with plausible bounds of Endangered – Critically Endangered.

Criterion B: This ecosystem has an AOO of 135 10 x 10 km grid cells and an EOO of 17213.44 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.39% of the current distribution faces >90 percent degradation severity, 10.06% of the distribution faces >70 percent degradation severity, and 60.8% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

MALEMA GRANITE ESCARPMENT MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Miombo da escarpa granítica de Malema

Biome Savannas and grasslands (T4)

Functional group Pyric tussock savannas (T4.2)

Regional Ecosystem Zambezian Wet Miombo

Description

Moist mixed miombo woodland between 400 and 700 m in elevation.

Distribution

In northern Mozambique, between Lioma in the west and Lalaua in the east. Occurring in Nampula and Zambezia Provinces.

Characteristic native biota

A mixed miombo woodland variously dominated by the species *Brachystegia spiciformis, B. utilis, B. boehmii, B. manga* and *Julbernardia globiflora*, with *Brachystegia bussei* and *B. microphylla confined* to the rocky hills. Other trees recorded are *Acacia amythethophylla, A. gerrardii, Acacia goetzei, A. nigrescens, A. nilotica* subsp. *kraussiana, A. sieberiana* var. *woodii, Albizia antunesiana, Amblygonocarpus andongensis, Antidesma venosum, Baphia massaiensis* subsp. *gomesii, Bombax rhodognaphalon, Burkea africana, Cassia abbreviata* subsp. *beareana, Cleistochlamys kirkii, Combretum adenogonium, C. molle, Commiphora africana* var. *rubriflora, C. mollis, Crossopteryx febrifuga, Dalbergia boehmii, D. melanoxylon, Diospyros senensis, Diplorhynchus condylocarpon, Erythrophleum africanum, Garcinia pachyclada, Hirtella zanzibarica, Lannea discolor, Maerua angolensis, Millettia stuhlmannii, M. usaramensis, Monotes engleri, Oxytenanthera abyssinica, Parinari curatellifolia, Pericopsis angolensis, Philenoptera bussei, Piliostigma thonningii, Pterocarpus angolensis, P. rotundifolius* subsp. *polyanthus, Sclerocarya birrea* subsp. *caffra, Swartzia madagascariensis, Pseudolachnostylis maprouneifolia, Syzygium* sp., *Terminalia mollis, T. sericea, T. stenostachya, Uapaca nitida, Xeroderris stuhlmannii*, and *Ziziphus abyssinica.*

Small trees and shrubs include *Annona senegalensis, Bauhinia petersiana, Bridelia cathartica* f. *niedenzui, Catunaregam stenocarpa, Combretum psidioides* subsp. *psidioides, C. umbricola, Dalbergiella nyasae, Dichrostachys cinerea* subsp. *africana* and subsp. *nyassana, Elephantorrhiza goetzei, Entada abyssinica, Hymenocardia acida, Hymenodictyon floribundum, Mundulea sericea, Ormocarpum kirkii, Pavetta schumanniana, Pleurostylia africana, Protea angolensis* subsp. *divaricata, Rourea orientalis, Senna petersiana, Synaptolepis alternifolia,* and *Tricalysia coriacea* subsp. *nyassae.*

Small shrubs and herbaceous species recorded are *Aeschynomene minutiflora, A. nematopoda, Agathisanthemum bojeri, Blepharis affinis, Burnatia enneandra, Chamaecrista gracilior, C. polytricha, Crotalaria glauca, C. hyssopifolia, C. natalitia, C. shirensis, Dolichos kilimandscharicus, Eriosema psoraleoides, Helichrysum kirkii* var. *petersii, Indigofera ormocarpoides, Kalanchoe humilis, K. lanceolata, Spermacoce pusilla*, and *Trichodesma ambacense* subsp. *hockii.*

Grasses recorded are *Andropogon gayanus* var. *polycladus, A. fastigiatus, Arthraxon quartinianus, Cenchrus unisetus, Chloris virgata, Cymbopogon giganteus, Diandrochloa namaquensis, Diheteropogon amplectens, Echinochloa crus-pavonis, Elytrophorus spicatus, Eragrostis aspera, E. cilianensis, E. ciliaris, E. cylindriflora, E. racemosa, E. tremula, Euclasta condylotricha, Hackelochloa granularis, Heteropogon contortus, Hyparrhenia filipendula* var. *filipendula, H. rufa, H. schimperi, H. variabilis, Hyperthelia dissoluta, Imperata cylindrica, Leptocarydion vulpiastrum, Loudetia arundinacea, L. flavida, L. phragmitoides, Mnesithea laevis, Panicum maximum, Pennisetum purpureum, Perotis patens, Pogonarthria squarrosa, Rottboellia cochinchinensis, Sacciolepis spiciformis, Schizachyrium exile, Setaria*

incrassata, Sorghum conspicuum, Stereochlaena cameronii, Themeda triandra, Trachypogon spicatus, Tristachya nodiglumis, T. superba, T. welwitschii, and *Zonotriche inamoena.*

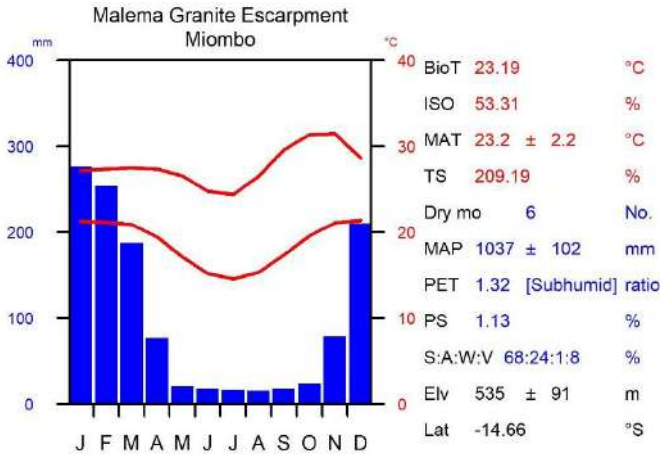
On lower-lying areas on heavier grey clayey soils are typically *Acacia polyacantha* subsp. *campylacantha, A. nigrescens, A. goetzei, Adansonia digitata, Afzelia quanzensis, Albizia harveyi, A. versicolor, Bauhinia petersiana, Combretum imberbe, Dalbergia melanoxylon, Diospyros kirkii, Kigelia africana, Lannea discolor, Millettia stuhlmannii, Oxytenanthera abyssinica, Philenoptera violacea, Sclerocarya birrea* subsp. *caffra, Sterculia appendiculata, Tamarindus indica,* and *Xeroderris stuhlmannii*.

Riparian woodland includes, among other typical riverine species, *Albizia glaberrima* subsp. *glabrescens, Combretum microphyllum, Diospyros mespiliformis, Hyphaene petersianus, Pandanus livingstonianus, Philenoptera violacea,* and *Tamarindus indica.*

Abiotic environment and climate

Altitude range of 370 to 700 m asl with a mean of 535 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 64.4% while the similarly measured clay content is 22.4%. Soil pH is 6.0.

Precipitation during driest quarter is 10.5 mm.



Species of Conservation Importance

Biogeographic Anomalies

Garcinia platyclada is rare.

Photographic credits Near Lioma, Zambezia Province. photo: M. Lotter.

RLE Assessment

Assessment Summary

This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 29.02% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 125 10 x 10 km grid cells and an EOO of 12774.21 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.24% of the current distribution faces >90 percent degradation severity, 3.48% of the distribution faces >70 percent degradation severity, and 35.43% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

MANDA MOIST MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Miombo húmido de Manda
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Zambezian Wet Miombo

Description

Dense and wet deciduous miombo woodland on deep sands (Mikindani beds), akin to sand forest.

Distribution

On the sandy undulating terrain north of Lichinga, up to the Rovuma River and extending into adjacent Tanzania. Occurring in Niassa Province.

Characteristic native biota

This vegetation type is dominated by the following species: *Brachystegia spiciformis, B. boehmii, B. longifolia, Julbernardia globiflora* and *Uapaca kirkiana* but on the hills and high ground *Brachystegia microphylla* is the characteristic tree species. Other common tree species include *Brachystegia manga, Dalbergia nitidula, Diplorhynchus condylocarpon, Erythrophleum africanum, Ficus ovata, Monotes africana, Parinari curatellifolia and Pterocarpus angolensis*, as well as scattered clumps of the bamboo *Oxytenanthera abyssinica*. On soils with a higher water table, trees and shrubs are fewer and shorter, typically consisting of *Annona senegalensis, Erica benguelensis* subsp. *benguelensis, Julbernardia globiflora, Memecylon flavovirens, Protea angolensis* var. *divaricata, P. gaguedi, Strychnos pungens, Syzygium pratense, Vangueria infausta* and *Vitex mombassae*.

Smaller trees and shrubs recorded from this vegetation type are: *Clerodendrum toxicarium, Coptosperma neurophylla, Crotalaria natalitia, Diospyros verrucosa, Embelia xylocarpa, Flacourtia indica, Gymnanthemum bellinghamii, Hexalobus monopetalus* var. *obovatus, Indigofera atriceps* subsp. *atriceps, Keetia venosa, Monanthotaxis buchananii, Olax dissitiflora, O. obtusifolia, Ormocarpum kirkii, Pavetta schumanniana, Psychotria capensis* subsp. *riparia, P. mahonii, P. leuconeura,* and *Rotheca myricoides* subsp. *myricoides* var. *discolor.*

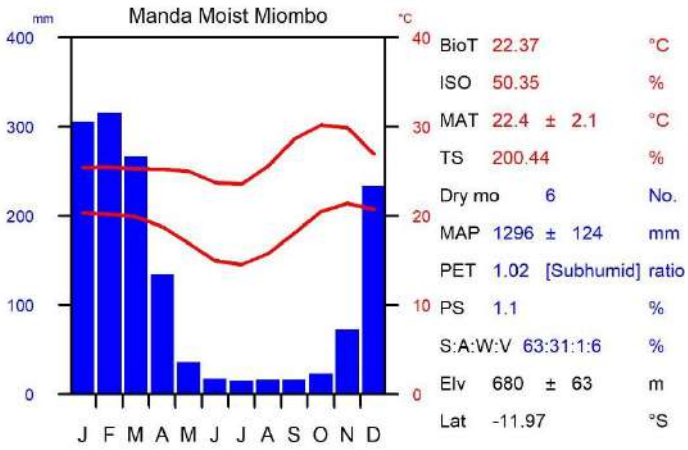
The ground flora includes several herbs, geoxylic suffrutices and shrublets including *Burmannia madagascariensis, Diospyros anitae, Dorstenia cuspidata, Leptactina benguelensis* subsp. *pubescens, Lindackeria stipulata, Polygala stenopetala* and *Tetracera bussei.*

Numerous streams and rivers are bordered by trees such as *Breonadia salicina, Faurea delevoyi, Gardenia imperialis, Synsepalum passargei, Syzygium cordatum* and *Syzygium owariensis.*

Abiotic environment and climate

Altitude range of 550 to 860 m asl with a mean of 680 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 56.5% while the similarly measured clay content is 26.1%. Soil pH is 6.1.

Precipitation during driest quarter is 7.7 mm.



Species of Conservation Importance

Endemic Plant Species

Asparagus humifusus S.M. Burrows & J.E.Burrows, sp. nov. [E].

Biogeographic Anomalies

This unit is significant for the number of species that extend southwards over the border from Malawi or Tanzania and are found nowhere else in Mozambique beyond this corner of Niassa Province, including *Diospyros anitae*, *Ficus ovata*, *Lindackeria stipulata*, *Memecylon flavovirens*, *Psychotria leuconeura*, *Strychnos pungens*, and *Tetracera bussei.*

Photographic credits *Left*: *Brachystegia microphylla* miombo woodland, Manda Wilderness area, Niassa Province; *right*: *Brachystegia longifolia* miombo woodland, north of Unango, Niassa Province. photos: J. Burrows.

RLE Assessment

Assessment Summary

This ecosystem has a restricted geographic distribution but there is little evidence of ongoing declines in extent. However, moderate degradation levels are present across most of the distribution of the ecosystem. **Vulnerable**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 1.3% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 102 10 x 10 km grid cells and an EOO of 8737.47 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.4% of the current distribution faces >90 percent degradation severity, 4.78% of the distribution faces >70 percent degradation severity, and 90.31% of the distribution faces >50 percent degradation severity. Vulnerable

Criterion E: Not evaluated

MARRUPA PLATEAU MOIST MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Miombo húmido do Planalto de Marrupa
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Zambezian Wet Miombo

Description

Deciduous miombo woodland dominated by *Brachystegia* or *Julbernardia* with a well-developed grass layer beneath.

Distribution

The Marrupa Plateau above 700 m, includes numerous inselbergs that have not been individually mapped. Confined to Niassa Province.

Characteristic native biota

A rich miombo woodland dominated by *Brachystegia spiciformis, B. allenii, B. boehmii, B. bussei, B. longifolia, P. manga, B. utilis,* and *Julbernardia globiflora*. Other trees are *Acacia goetzei* subsp. *microphylla, A. nilotica* subsp. *kraussiana, A. polyacantha* subsp. *campylacantha, A. sieberiana* var. *sieberiana, Albizia amara* subsp. *sericocephala, A. harveyi, Boscia angustifolia* var. *corymbosa, Bridelia cathartica* var. *lingelsheimii, Cassia abbreviata* subsp. *beareana, Combretum adenogonium, C. apiculatum, C. collinum, C. molle, Commiphora mollis, C. mossambicensis, Cussonia arborea, Dalbergia boehmii, D. nitidula, Dalbergiella nyassae, Diplorhynchus condylocarpon, Dombeya rotundifolia, Erythrina latissima, Faurea saligna, Ficus petersii, Garcinia livingstonei, Gardenia ternifolia* subsp. *jovis-tonantis, Heteropyxis natalensis, Hirtella zanzibarica, Holarrhena pubescens, Maerua angolensis, Monotes engleri, Olax dissitiflora, Ozoroa reticulata, Oxytenanthera abyssinica, Parinari curatellifolia, Pericopsis angolensis, Philenoptera bussei, Phyllocosmus lemaireanus, Piliostigma thonningii, Pseudolachnostylis maprouneifolia, Pterocarpus angolensis, Stereospermum kunthianum, Strychnos cocculoides, S. madagascariensis, Swartzia madagascariensis, Terminalia sericea, Tetracera boiviniana, Uapaca kirkiana, U. nitida, U. sansibarica*, and *Ziziphus abyssinica.*

Small trees and woody shrubs recorded are *Abrus precatorius, Annona senegalensis, Bauhinia petersiana, Combretum psidioides* subsp. *psidioides, Dalbergia melanoxylon, Dichrostachys cinerea* subsp. *nyassana, Diospyros squarrosa, D. truncatifolia, D. verrucosa, Elephantorrhiza goetzei, Embelia xylocarpa, Flacourtia indica, Hexalobus monopetalus* var. *obovatus, Hugonia orientalis, Hymenocardia acida, Maprounea africana, Margaritaria discoidea* f. *glabra, Markhamia obtusifolia, Monanthotaxis buchananii, M. obovata, Mundulea sericea, Ormocarpum kirkii, Pavetta crassipes, Phyllanthus reticulatus* var. *glaber, P. welwitschianus, Protea angolensis* var. *divaricata, P. gaguedi, P. welwitschii, Psorospermum febrifugum, Rothmannia fischeri* subsp. *fischeri, Rourea orientalis, Searsia longipes, Securidaca longepedunculata, Tapiphyllum cinerascens* var. *laevius, Turraea zambesica*, and *Vangueria infausta.*

Riparian fringes and wet woodland may support *Albizia versicolor, Antidesma venosum, Bombax rhodognaphalon, Bridelia micrantha, Philenoptera violacea, Syzygium niassense, S. cordatum, Treculia africana, Vitex doniana,* with climbers *Dalbergia arbutifolia, D. fischeri, Mezoneuron angolense,* and *Landolphia parvifolia.*

Small shrubs and herbaceous species: *Aeschynomene schliebenii* var. *mossambicensis, Aeschynomene tenuirama* var. *tenuirama, Agathisanthemum globosum, Aspilia mossambicensis, Begonia princeae, Burmannia madagascariensis, Chamaecrista polytricha, Cheilanthes angustifrondosa, Chlorophytum colubrinum, Clematis scabiosifolia, C. villosa, Crepidorhopalon parviflorus, Crotalaria adamsonii, C. assurgens, C. capensis, C. caudata, C. kirkii, C. lachnocarpoides, C. ochroleuca, C. valida, Cryptosepalum maraviense, Cyphostemma setosum, Dolichos kilimandscharicus, Droogmansia*

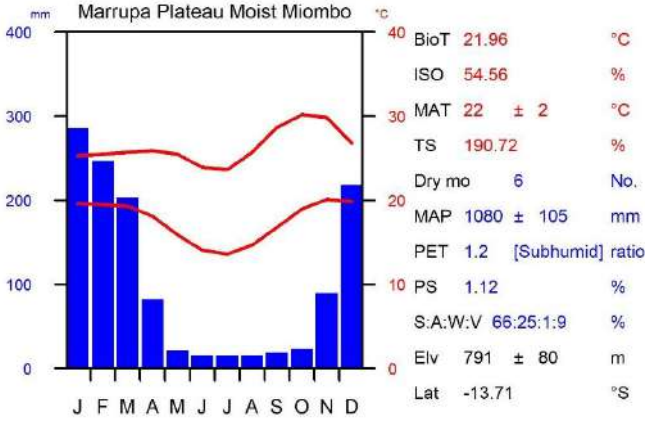
pteropus, Gladiolus dalenii, G. quartinianus, Gnidia chrysantha, Indigofera atriceps subsp. *atriceps, I. dendroides, I. ormocarpoides, I. paniculata, Kotschya africana* var. *bequaertii, K. strigosa* var. *strigosa, Oldenlandia goreensis* var. *goreensis, Orthosiphon allenii, Phyllanthus glaucophyllus, Phyllanthus nummulariifolius* subsp. *nummulariifolius, Polygala petitiana, P. sparsiflora* var. *ukirensis, Pseudoeriosema longipes, Rhynchosia resinosa, Sesamum angolense, Sphenostylis erecta, Temnocalyx obovata,* and *Tephrosia paradoxa.*

Grasses recorded are *Andropogon schirensis, Brachiaria serrata, Eragrostis gangetica, E. welwitschii, Digitaria diagonalis, D. milanjiana, Hyparrhenia nyassae, Loudetia arundinacea, L. simplex, Melinis repens* subsp. *repens, Panicum lindleyanum, P. phragmitoides, Sacciolepis chevalieri, S. indica*, and *Setaria pumila.*

Abiotic environment and climate

Altitude range of 700 to 1010 m asl with a mean of 790 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 62.0% while the similarly measured clay content is 23.6%. Soil pH is 5.6.

Precipitation during driest quarter is 5.3 mm.



Species of Conservation Importance

Endemic Plant Species

Indigofera emarginella var. *marrupaensis* [E].

Photographic credits *Left*: Marrupa to Lugenda Bridge, Niassa Province. photo: M. Lotter; *right*: between Marrupa and Cuamba, Niassa Province. photo: J. Burrows.

RLE Assessment

Assessment Summary

This ecosystem has a restricted geographic distribution but there is little evidence of ongoing declines in extent. However, moderate degradation levels are present across most of the distribution of the ecosystem. **Vulnerable**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 9.45% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 122 10 x 10 km grid cells and an EOO of 12536.82 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 5.2% of the current distribution faces >90 percent degradation severity, 12.24% of the distribution faces >70 percent degradation severity, and 91.29% of the distribution faces >50 percent degradation severity. Vulnerable

Criterion E: Not evaluated

MATONDONVELA MOIST MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Miombo húmido de Matondonvela

Biome Savannas and grasslands (T4)

Functional group Pyric tussock savannas (T4.2)

Regional Ecosystem Zambezian Wet Miombo

Description

Miombo woodland is interspersed with a number of hydromorphic grasslands or dambos that support a rich herbaceous flora while along the centre a small stream is often found, fringed by a thin band of evergreen forest dominated by *Syzygium niassensis* and *Syzygium cordatum*, with *Brachystegia allenii* on the slopes.

On rocky slopes an open woodland of *Brachystegia microphylla* is found, and on footslopes a tall dense woodland dominated by *Julbernardia globiflora* and *Brachystegia utilis*, *B. bussei* and *B. boehmii* up to 15 m high. On steeper slopes within miombo woodland, especially where areas have been cleared in the past, bamboo (*Oxytenanthera abyssinica*) thickets are common.

Mixed miombo woodland.

Distribution

North-east and east of the Lichinga Plateau, comprising areas between 400 and 700 m. Occurring in Niassa Province.

Characteristic native biota

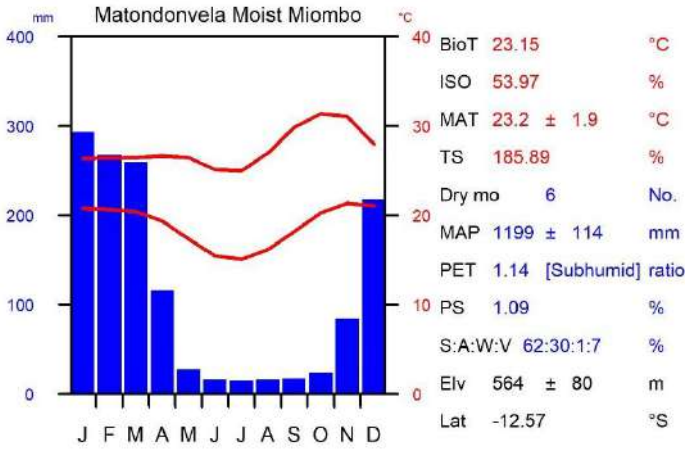
Miombo woodland dominated by *Brachystegia* spp. or *Julbernardia* with a well-developed grass layer below. Main species are *Acacia amythethophylla, Albizia antunesiana, Brachystegia boehmii, B. manga, B. spiciformis, Baphia massaiensis* subsp. *gomesii, Boscia salicifolia, B. mossambicensis, Burkea africana, Cassia abbreviata, Dalbergia nitidula, Diplorhynchus condylocarpon, Faurea rochetiana, F. saligna, Julbernardia globiflora, Olax dissitiflora, Philenoptera bussei, P. violacea, Phyllocosmus lemaireanus, Pterocarpus angolensis, Pericopsis angolensis, Pseudolachnostylis maprouneifolia, Protea welwitschii, Pterocarpus angolensis, Strychnos madagascariensis, Swartzia madagascariensis,* and *Xeroderris stuhlmannii.*

Shrubs and small trees recorded are *Afrocanthium racemulosum, Barleria vollesenii, Diospyros squarrosa, D. truncatifolia, Elephantorrhiza goetzei, Entada chrysostachys, Hugonia orientalis, Maerua juncea* subsp. *juncea, Oncoba spinosa,* and *Ximenia caffra.*

Abiotic environment and climate

Altitude range of 400 to 700 m asl with a mean of 564 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 61.4% while the similarly measured clay content is 24.0%. Soil pH is 5.9.

Precipitation during driest quarter is 6.1 mm.



Species of Conservation Importance

Endemic Plant Species

Barleria vollesenii [NE*], *Utricularia podadena* [NE].

Threatened Plant Species

Barleria vollesenii [EN*].

Photographic credits Miombo woodland near Serra Mecula, Niassa Province. photo: J. Timberlake

RLE Assessment

Assessment Summary

This ecosystem has a restricted geographic distribution but there is little evidence of ongoing declines in extent. However, moderate degradation levels are present across most of the distribution of the ecosystem. **Vulnerable**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 3.15% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 345 10 x 10 km grid cells and an EOO of 42803.01 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 1.62% of the current distribution faces >90 percent degradation severity, 5.15% of the distribution faces >70 percent degradation severity, and 88.41% of the distribution faces >50 percent degradation severity. Vulnerable

Criterion E: Not evaluated

MOCUBA MOIST MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Miombo húmido de Mocuba
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Zambezian Wet Miombo

Description

Deciduous miombo woodland.

Distribution

Mocuba plateau between Derre and Mucuali. Occurring in Nampula and Zambezia Provinces.

Characteristic native biota

A large area of principally miombo woodland dominated by *Brachystegia spiciformis, B. boehmii* and *Julbernardia globiflora*, with a long list of trees species typically associated with miombo: *Acacia amythethophylla, A. goetzei* (vars. *goetzei* and *microphylla*), *A. sieberiana* var. *woodii, Albizia adianthifolia, A. antunesiana, A. versicolor, Amblygonocarpus andongensis, Boscia salicifolia, Brackenridgea zanguebarica, Burkea africana, Cassia abbreviata, Combretum zeyheri, Dalbergia boehmii, D. lactea, D. nitidula, Dalbergiella nyassae, Diplorhynchus condylocarpon, Ekebergia benguelensis, Erythrina abyssinica, Erythrophleum africanum, Hirtella zanzibarica, Holarrhena pubescens, Millettia stuhlmannii, Parinari curatellifolia, Pericopsis angolensis, Philenoptera bussei, Phyllocosmus lemaireanus, Piliostigma thonningii, Pseudolachnostylis maprouneifolia, Pteleopsis myrtifolia, Pterocarpus angolensis, P. rotundifolius* subsp. *polyanthus, Swartzia madagascariensis, Swartzia madagascariensis, Terminalia sericea, Tetracera boiviniana, Uapaca nitida* and *Xeroderris stuhlmannii.*

Smaller trees and shrubs include *Annona senegalensis, Artabotrys brachypetalus, Bauhinia petersiana, Dichrostachys cinerea* subsp. *nyassana, Diospyros squarrosa, Elephantorrhiza goetzei, Flacourtia indica, Hugonia busseana, H. orientalis, Hymenocardia acida, Monanthotaxis buchananii, Olax dissitiflora, Ormocarpum kirkii, Psorospermum febrifugum, Rourea orientalis, Senna petersiana, Sphaerocoryne gracilis, Vitex mombassae, Ximenia caffra* and *Xylopia parviflora*. The family *Rubiaceae* is abundant, with *Catunaregam swynnertonii, Cremaspora triflora, Cuviera schliebenii, Leptactina delagoensis, Pavetta klotzschiana, Polysphaeria lanceolata, Psydrax livida, Rothmannia engleriana, Tarenna junodii, Tricalysia jasminiflora* var. *jasminiflora,* and *T. schliebenii.*

In lower lying areas on heavier soils occur trees such as *Acacia nilotica* subsp. *kraussiana, A. polyacantha* subsp. *campylacantha, A. nigrescens, Combretum adenogonium, C. imberbe, Entada abyssinica, Mimusops obtusifolia, Philenoptera violacea, Sterculia africana* and *Trichilia capitata*, with small trees and shrubs including *Cleistochlamys kirkii, Combretum holstii, Dalbergia melanoxylon, Dichrostachys cinerea* subsp. *africana, Diospyros loureiriana, D. senensis, Grewia flavescens*, and *Rinorea elliptica.*

The small shrub flora includes *Aeschynomene cristata, A. mossambicensis, A. nodulosa, A. nyassana, Chamaecrista grantii, C. mimosoides, Crotalaria hyssopifolia, C. lanceolata, C. retusa, Cryptosepalum maraviense, Decorsea schlechteri, Eriosema parviflorum, E. psoraleoides, Geophila obvallata, Pseudarthria hookeri* and *Rhynchosia divaricata.*

The grass flora is diverse in such a large region and includes the following: *Alloteropsis papillosa, Andropogon schirensis, Bothriochloa bladhii, Chloris pycnothrix, Digitaria milanjiana, Eragrostis ciliaris, E. cylindriflora, E. inamoena, E. lehmanniana, E. racemosa, Heteropogon contortus, H. melanocarpus, Hyparrhenia rufa, Hyperthelia dissoluta, Panicum genuflexum, P. infestum, P. maximum, P. trichocladum, Sacciolepis myosuroides, S. spiciformis, Sorghum arundinaceum, Stereochlaena cameronii, Themeda triandra* and *Urochloa trichopus.*

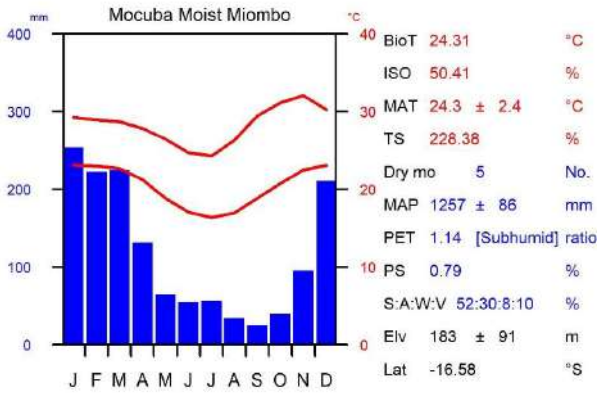
Rocky hills within this region support trees such as *Afzelia quanzensis, Brachystegia bussei, B. microphylla, B. utilis, Diospyros natalensis, Diplorhynchus condylocarpon, Mundulea sericea, Sterculia quinqueloba*, with smaller trees and shrubs often occurring in sheltered gullies, such as *Alchornea laxiflora, Allophylus africanus, Cassipourea euryoides, Dalbergia arbutifolia, Dovyalis hispidula, Erythroxylum emarginatum, Rytigynia umbellulata* and *Searsia acuminatissima.*

The riverine vegetation is characterized by *Acacia robusta* subsp. *usambarensis, A. sieberiana* var. *sieberiana, Albizia glaberrima* var. *glaberrima, A. versicolor, Burttdavya nyasica, Cleistanthus schlechteri, Erythrophleum suaveolens, Ficus sycomorus* subsp. *sycomorus, Homalium abdessammadii, Khaya anthotheca, Parkia filicoidea, Pteleopsis myrtifolia,* with lianes such as *Paullinia pinnata* and *Strophanthus courmontii.*

Abiotic environment and climate

Altitude range of 32 to 400 m asl with a mean of 183 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 68.3% while the similarly measured clay content is 18.2%. Soil pH is 6.1.

Precipitation during driest quarter is 57.3 mm.



Species of Conservation Importance

Endemic Plant Species

Adenia zambesiensis [E], *Euphorbia stenocaulis* [E], *Tricalysia jasminiflora* var. *hypotephros* [E].

Threatened Plant Species

Euphorbia stenocaulis [EN].

Photographic credits Top *Top left*: Gile Reserve. photo: M. Lotter; *top right*: Gile Reserve. photo: N. Ribiero; *bottom*: Gile Reserve. photo: J. Burrows

RLE Assessment

Assessment Summary	Assessment Information
This ecosystem has a restricted geographic distribution but there is little evidence of ongoing declines in extent. However, moderate degradation levels are present across most of the distribution of the ecosystem. **Vulnerable**	**Criterion A:** Expansion of urban areas, agriculture & deforestation has caused a 19.61% decline since 1750. Least Concern **Criterion B:** This ecosystem has an AOO of 414 10 x 10 km grid cells and an EOO of 46566.72 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern **Criterion C:** Not evaluated **Criterion D:** Degradation assessment shows that 18.83% of the current distribution faces >90 percent degradation severity, 39.53% of the distribution faces >70 percent degradation severity, and 91.23% of the distribution faces >50 percent degradation severity. Vulnerable **Criterion E:** Not evaluated

MONTEPUEZ PLATEAU MOIST MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Miombo húmido do Planalto de Montepuez
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Zambezian Wet Miombo

Description

Moist deciduous miombo.

Distribution

Montepuez Plateau in Cabo Delgado Province.

Characteristic native biota

The western half of this vegetation type is a typical seasonally-dry miombo woodland dominated by *Brachystegia spiciformis* and *Julbernardia globiflora*, but with *Brachystegia allenii, B. boehmii* and *B. utilis* contributing to the miombo. Other commonly associated trees are *Acacia goetzei* subsp. *microphylla, Albizia amara* subsp. *amara, Brackenridgea zanguebarica, Combretum collinum, C. zeyheri, Erythrophleum africanum, Dalbergia boehmii, D. melanoxylon, Dalbergiella nyassae, Elephantorrhiza goetzei, Ficus sycomorus* subsp. *gnaphalocarpa, Hymenocardia acida, Millettia bussei, Pseudolachnostylis maprouneifolia, Pterocarpus angolensis, Swartzia madagascariensis, Uapaca kirkiana, U. nitida* and *Xeroderris stuhlmannii*, with scattered thickets of various extents of the bamboo *Oxytenanthera abyssinica*.

Small tree and woody shrubs include *Annona senegalensis, Baphia massaiensis* subsp. *obovata, Bauhinia petersiana, Diospyros truncatifolia, Grevea eggelingii* var. *eggelingii, Markhamia obtusifolia, Monodora junodii* var. *junodii, Olax dissitiflora, Ormocarpum kirkii, Pavetta crassipes, Senna petersiana, S. singueana, Vitex mombassae* and *V. payos* var. *glabrescens.*

On heavier soils one encounters *Acacia amythethophylla, A. nilotica* subsp. *kraussiana, A. polyacantha* subsp. *campylacantha, Combretum adenogonium, C. apiculatum, Commiphora viminea, Diplorhynchus condylocarpon, Entada abyssinica, Philenoptera violacea, Piliostigma thonningii, Thilachium africanum* and *Xylotheca tettensis.*

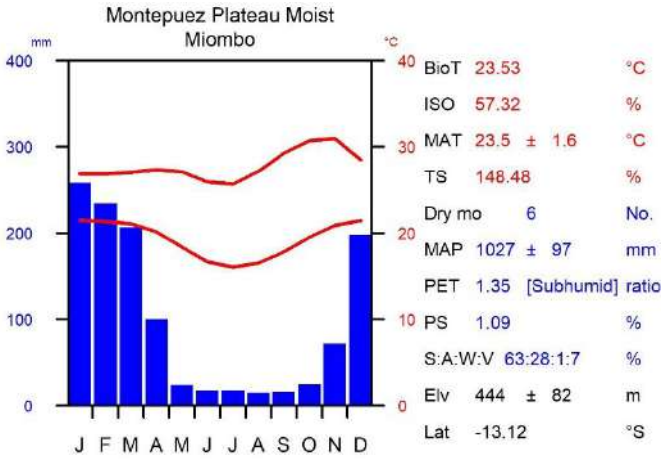
The area is dotted with numerous rocky hills which supports trees such *Albizia tanganyicensis, Ficus abutilifolia, F. glumosa, Sterculia quinqueloba*, and shrubs such as *Alchornea laxiflora, Croton pseudopulchellus, Monanthotaxis obovata* and *Strophanthus hypoleucus. Xerophyta squarrosa* and *X. zambiana* are frequent on open sheetrock. Rivers are fringed by *Acacia robusta var. clavigera, Albizia adianthifolia, A. versicolor, Breonadia salicina, Cordyla africana, Pancovia golungensis, Sterculia appendiculata, Tamarindus indica, Trichilia emetica* and other typical riverine trees of the region.

In the eastern portion of this vegetation type there is a strong influence of coastal dry forest elements coming in, typically *Millettia stuhlmannii,* with *Acacia robusta* subsp. *usambarensis, Buchnerodendron lasiocalyx, Carpodiptera africana, Combretum umbricola, Commiphora serrata, C. zanzibarica, Dichapetalum stuhlmannii, Dombeya shupangae, Dracaena mannii, Grewia monticola, Harrisonia abyssinica, Heinsia crinita* subsp. *parviflora, Hugonia orientalis, Hymenocardia ulmoides, Keetia zanzibarica, Monodora grandidieri, Parkia filicoidea, Pteleopsis anisoptera, P. barbosae, Sterculia appendiculata, Tabernaemontana elegans, Tetracera boivinii, Xylotheca tettensis* subsp. *macrophylla,* and the Mozambique endemic dwarf shrub *Maerua andradae.*

Abiotic environment and climate

Altitude range of 280 to 610 m asl with a mean of 444 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 61.4% while the similarly measured clay content is 24.3%. Soil pH is 6.0.

Precipitation during driest quarter is 9.1 mm.



Species of Conservation Importance

Endemic Plant Species

Euphorbia unicornis [E].

Threatened Plant Species

Euphorbia unicornis [EN].

Biogeographic Anomalies

Maerua andradae is an endemic to north-eastern Mozambique.

RLE Assessment

Assessment Summary

This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 27.81% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 251 10 x 10 km grid cells and an EOO of 26682.22 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.81% of the current distribution faces >90 percent degradation severity, 2.98% of the distribution faces >70 percent degradation severity, and 30.72% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

MORRUMBALA LOWLAND MOIST MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Miombo húmido das terras baixas de Morrumbala

Biome Savannas and grasslands (T4)

Functional group Pyric tussock savannas (T4.2)

Regional Ecosystem Zambezian Wet Miombo

Description

A mixed deciduous miombo woodland, with *Diplorhynchus condylocarpon* often common, forming a mosaic or intermix with *Acacia-Combretum* woodland in lower-lying areas and on more clay soils.

Distribution

Just north of the Zambezi River in Zambezia province, situated around the base of the Morrumbala Plateau. Occurring in Tete and Zambezia Provinces.

Characteristic native biota

The miombo is composed of *Brachystegia spiciformis, B. boehmii,* and *Julbernardia globiflora*. Important trees are *Acacia gerrardii, A. karroo, A. nigrescens, A. nilotica* subsp. *kraussiana, A. polyacantha* subsp. *campylacantha, A. robusta* subsp. *usambarensis, A. sieberiana* var. *woodii, A. welwitschii* subsp. *delagoensis, Albizia harveyi, Boscia salicifolia, Burkea africana, Cleistanthus schlechteri, Cleistochlamys kirkii, Combretum adenogonium, C. apiculatum, C. collinum, C. hereroense, C. molle, C. zeyheri, Commiphora africana, C. serrata, Crossopteryx febrifuga, Cussonia zimmermannii, Dalbergia boehmii, Dalbergia nitidula, Diplorhynchus condylocarpon, Ficus lutea, F. stuhlmannii, Gardenia ternifolia* var. *jovis-tonantis, Kirkia acuminata* (on hills), *Lannea discolor, L. schweinfurthii, Manilkara mochisia, Millettia stuhlmannii, M. usaramensis* subsp. *australis, Parinari curatellifolia, Peltophorum africanum, Pericopsis angolensis, Philenoptera bussei, Piliostigma thonningii, Pseudolachnostylis maprouneifolia, Pterocarpus angolensis, P. brenanii, P. lucens* subsp. *antunesii, Sclerocarya birrea* subsp. *caffra, Sterculia africana, S. quinqueloba, Stereospermum kunthianum, Strychnos henningsii, S. madagascariensis, S. potatorum, Swartzia madagascariensis, Terminalia sericea, T. stenostachya, Trichilia capitata, Uapaca kirkiana, U. nitida, Xeroderris stuhlmannii, Ziziphus mauritiana*, and *Z. mucronata* subsp. *mucronata.*

Small trees, woody shrubs and lianes include *Allophylus africanus, Annona senegalensis, Bauhinia petersiana, B. tomentosa, Bridelia cathartica, Cadaba kirkii, Coffea racemosa, Capparis erythrocarpos, Dalbergia melanoxylon, Deinbollia xanthocarpa, Dielsiothamnus divaricatus, Diospyros loureiriana, D. squarrosa, Dombeya burgessiae, Empogona junodii, Euclea natalensis* subsp. *obovata, Flacourtia indica, Grewia micrantha, Gymnosporia buxifolia, G. senegalensis, Heinsia crinita* subsp. *parviflora, Hymenocardia acida, Maerua brunnescens, Markhamia zanzibarica, Monanthotaxis obovata, Ozoroa obovata* var. *obovata, Pavetta klotzschiana, P. refractifolia, Psychotria kirkii, Rourea orientalis, Securidaca longepedunculata, Vangueria randii* subsp. *chartacea, Ximenia caffra* var. *caffra*, and *Xylotheca tettensis* var. *tettensis.*

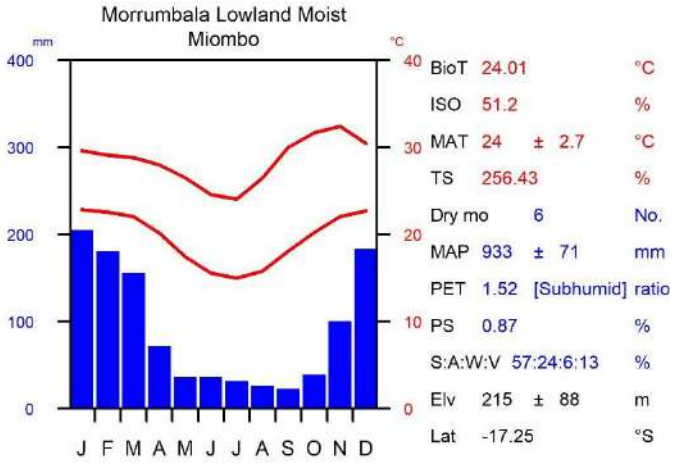
Softer shrubs and herbaceous species recorded are *Ceratotheca sesamoides, Clematis viridiflora, Neonotonia wightii* var. *longicauda, Neorautanenia mitis, Riocreuxia polyantha, Triumfetta pilosa*, and *Vigna vexillata*. Grasses recorded are *Cleistachne sorghoides, Hyperthelia dissoluta, Leptochloa uniflora, Melinis nerviglumis, M. repens*, and *Sorghastrum stipoides.*

Riparian forest (part of the Zambezi Riparian Forest) through this vegetation typically contains *Acacia robusta* subsp. *clavigera, Albizia versicolor, Antidesma venosum, Blighia unijugata, Combretum imberbe, Ficus sycomorus* subsp. *sycomorus, Khaya nyasica, Kigelia africana, Lecaniodiscus fraxinifolius, Newtonia hildebrandtii, Philenoptera violacea, Pteleopsis myrtifolia, Sterculia appendiculata, Tamarindus indica, Trichilia emetica, Voacanga thouarsii, Vitex doniana*, with smaller species such as *Hunteria zeylanica, Maclura africana* and *Tabernaemontana elegans*. Lianes include *Dalbergia arbutifolia, D. lactea,* and *Strophanthus kombe.*

Abiotic environment and climate

Altitude range of 40 to 470 m asl with a mean of 215 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 64.3% while the similarly measured clay content is 22.2%. Soil pH is 6.1.

Precipitation during driest quarter is 44 mm.



Species of Conservation Importance

Endemic Plant Species

Crassula morrumbalensis [E*].

Threatened Plant Species

Crassula morrumbalensis [CR*].

Photographic credits Between Campo and Morrumbala, Zambezia Province. photo: J. Burrows

RLE Assessment

Assessment Summary

This ecosystem has a highly restricted distribution in the Tete and Zambezia Provinces There is evidence of considerable historical declines, and deforestation & other threats are leading to continuing ongoing declines. **Endangered**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 41.29% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 129 10 x 10 km grid cells and an EOO of 16652.57 km2. It has undergone historical decline, and there is evidence that deforestation & other threats are leading to continuing decline. Endangered

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 46.47% of the current distribution faces >90 percent degradation severity, 72.71% of the distribution faces >70 percent degradation severity, and 90.53% of the distribution faces >50 percent degradation severity. Vulnerable

Criterion E: Not evaluated

MORRUMBALA PLATEAU MOIST MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Miombo húmido do Planalto de Morrumbala
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Zambezian Wet Miombo

Description

Moist deciduous miombo woodland.

Distribution

Just north of the Zambezi River in Zambezia province, situated on the Morrumbala Plateau, extending through Chire and Mongue into Malawi.

Characteristic native biota

A largely moist miombo woodland with drier *Acacia-Combretum* woodland at its lower altitudes. The miombo is composed of *Brachystegia spiciformis, B. boehmii, B. longifolia, B. manga*, and *Julbernardia globiflora*. Other important trees are *Acacia amythethophylla, A. polyacantha* subsp. *campylacantha, A. tortilis* subsp. *spirocarpa, A. welwitschii* subsp. *delagoensis, Albizia anthelmintica, A. harveyi, Azanza garckeana, Burkea africana, Combretum adenogonium, C. collinum, C. molle, C. zeyheri, Crossopteryx febrifuga, Cussonia arborea, Dalbergia boehmii, Dalbergiella nyassae, Diospyros kirkii, Diplorhynchus condylocarpon, Dombeya rotundifolia, Erythrophleum africanum, Ficus ingens, Lannea schweinfurthii, Millettia stuhlmannii, Parinari curatellifolia, Pericopsis angolensis, Philenoptera bussei, Piliostigma thonningii, Pseudolachnostylis maprouneifolia, Pterocarpus angolensis, P. rotundifolius* subsp. *polyanthus, Schinziophyton rautanenii, Sclerocarya birrea* subsp. *caffra, Senna singueana, Stereospermum kunthianum, Strychnos madagascariensis, Syzygium guineense, Terminalia sericea, T. stenostachya, Uapaca kirkiana, U. nitida,* and *Xeroderris stuhlmannii.*

Small trees, woody shrubs and lianes include *Annona senegalensis, Apodostigma pallens, Bauhinia petersiana, Clerodendrum toxicarium, Dalbergia melanoxylon, Gymnanthemum coloratum, Gymnosporia senegalensis, Markhamia obtusifolia, Ozoroa obovata* var. *obovata, Pavetta crassipes, Protea welwitschii, Senna petersiana,* and *Xylotheca kraussiana*. Softer shrubs include *Euphorbia kirkii, Indigofera hirsuta, Jatropha multifida, Wedelia kotschyi*, with grasses *Eragrostis aspera, Oryza longistaminata* and *Themeda triandra.*

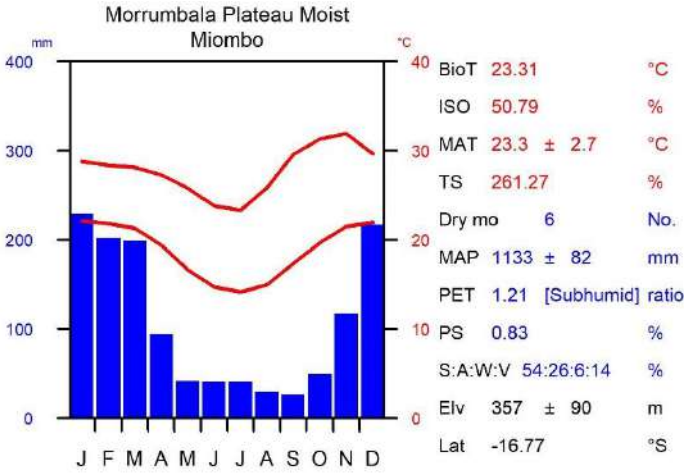
Riparian forest (part of the Zambezi Riparian Forest type) through this vegetation typically contains *Albizia glaberrima* subsp. *glabrescens, A. versicolor, Antidesma venosum, Erythrophleum suaveolens, Ficus sycomorus* subsp. *sycomorus, Kigelia africana, Philenoptera violacea, Pteleopsis myrtifolia, Tamarindus indica, Vitex doniana*, amongst others.

Woody species recorded from the woodlands on the upper slopes of Mt Morrumbala *are Brachystegia* spp., *Albizia zimmermannii, Coffea zanguebariae, Croton pseudopulchellus, Dalbergia fischeri, Englerophytum magalismontanum, Faurea saligna, Grewia inaequilatera, Heteromorpha arborescens* var. *abyssinica, Kirkia acuminata, Philenoptera bussei, Protea welwitschii, Psorospermum febrifugum, Pteleopsis myrtifolia, Searsia acuminatissima* and *Turraea floribunda.*

Abiotic environment and climate

Altitude range of 150 to 600 m asl with a mean of 357 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 63.3% while the similarly measured clay content is 24.5%. Soil pH is 6.0.

Precipitation during driest quarter is 62.2 mm.



Species of Conservation Importance: none recorded.

RLE Assessment

Assessment Summary

This ecosystem has a highly restricted distribution in the Zambezia province. There is evidence of considerable historical declines, and deforestation & other threats are leading to continuing ongoing declines as well as significant degradation throughout the extent. **Endangered**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 63.91% decline since 1750. Vulnerable

Criterion B: This ecosystem has an AOO of 48 10 x 10 km grid cells and an EOO of 6816 km2. It has undergone substantial historical decline, and there is evidence that deforestation & other threats are leading to continuing decline. Endangered

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 70.22% of the current distribution faces >90 percent degradation severity, 84.24% of the distribution faces >70 percent degradation severity, and 88.21% of the distribution faces >50 percent degradation severity. Endangered

Criterion E: Not evaluated

MOSSURIZE ESCARPMENT MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Miombo da escarpa de Mossurize

Biome Savannas and grasslands (T4)

Functional group Pyric tussock savannas (T4.2)

Regional Ecosystem Zambezian Wet Miombo

Description

These dry *Brachystegia boehmii-B. allenii-Julbernardia globiflora* escarpment miombo woodlands give way to almost pure *J. globiflora* woodlands at altitudes below 1000 m.

Distribution

Espungabera escarpment area, extending from south of the Chimanimani Mountains into Zimbabwe. Occurring in Manica Province.

Characteristic native biota

Trees characterised by the miombo elements of *Brachystegia allenii*, *B. boehmii*, *B. spiciformis* and *Julbernardia globiflora,* with the additional trees *Amblygonocarpus andongensis, Erythrophleum suaveolens, Acacia sieberiana* var. *woodii, A. galpinii, A. polyacantha* subsp. *campylacantha, Albizia adianthifolia, A. versicolor, Burkea africana, Combretum collinum, C. hereroense, Cussonia arborea, Diplorhynchus condylocarpon, Dombeya shupangae, Ekebergia capensis, Erythrina abyssinica, Faurea saligna, Ficus lutea, Ficus sansibarica, Ficus sur, Heteropyxis dehniae, Millettia stuhlmannii, Parinari curatellifolia, Philenoptera bussei, Piliostigma thonningii, Pseudolachnostylis maprouneifolia, Pteleopsis myrtifolia, Pterocarpus rotundifolius* subsp. *rotundifolius, Senna petersiana, Stereospermum kunthianum, Strychnos madagascariensis, S. spinosa, Terminalia sericea, Uapaca kirkiana,* and *Xeroderris stuhlmannii.*

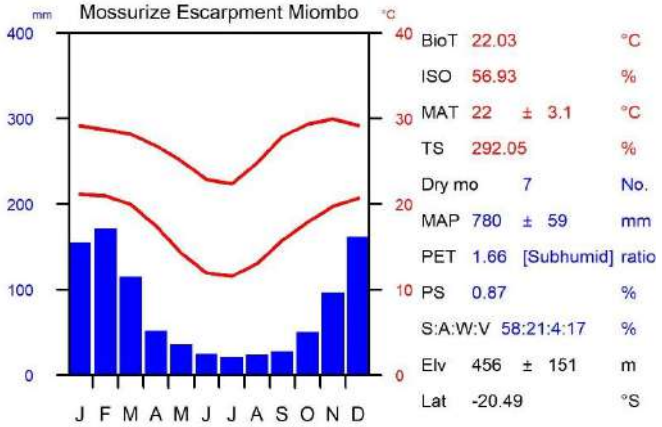
Shrubs typically are *Friesodielsia obovata, Dalbergia lactea, Grewia forbesii, Gymnanthemum myrianthum, Tannodia tenuifolia, Tricalysia pallens,* and *Xylopia parviflora.*

Climbers includes *Dictyophleba lucida, Dalbergia arbutifolia, Podranea brycei, Pterolobium stellatum, Rhoicissus revoilii,* and *Tiliacora funifera.*

Abiotic environment and climate

Altitude range of 170 to 820 m asl with a mean of 456 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 54.4% while the similarly measured clay content is 30.9%. Soil pH is 5.9.

Precipitation during driest quarter is 38.5 mm.



Species of Conservation Importance

Endemic Plant Species

Marsdenia gazensis [NE].

RLE Assessment

Assessment Summary	Assessment Information
Urban expansion, agriculture and deforestation have caused an almost 60% decline in this ecosystem since 1750 with ~35% of the current distribution facing high degradation severity. **Vulnerable**	**Criterion A:** Expansion of urban areas, agriculture & deforestation has caused a 59.63% decline since 1750. Vulnerable **Criterion B:** This ecosystem has an AOO of 41 10 x 10 km grid cells and an EOO of 3766.86 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern **Criterion C:** Not evaluated **Criterion D:** Degradation assessment shows that 34.81% of the current distribution faces >90 percent degradation severity, 64.56% of the distribution faces >70 percent degradation severity, and 92.39% of the distribution faces >50 percent degradation severity. Vulnerable **Criterion E:** Not evaluated

MUEDA ESCARPMENT MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Miombo da escarpa de Mueda
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Zambezian Wet Miombo

Description

Deciduous miombo woodland on Mueda escarpment.

Distribution

On the west-facing and northern slopes of Mueda Mountain, just south of the Rovuma River in northern Mozambique; Cabo Delgado Province. Likely also occurring in Tanzania.

Characteristic native biota

This escarpment miombo is typically composed of *Julbernardia globiflora, Brachystegia boehmii, B. manga, B. spiciformis, B. utilis, Diplorhynchus condylocarpon, Oxytenanthera abyssinica, Pericopsis angolensis, Pterocarpus angolensis, Sterculia quinqueloba*, and *Terminalia stenostachya*.

Other trees recorded are *Acacia goetzei* subsp. *microphylla, A. latistipulata, A. nilotica* subsp. *kraussiana, Acacia polyacantha* subsp. *campylacantha, A. robusta* subsp. *usambarensis, A. sieberiana* var. *sieberiana, Afzelia quanzensis, Albizia harveyi, A. versicolor, Bombax rhodognaphalon, Boscia salicifolia, Brackenridgea zanguebarica, Burkea africana, Commiphora africana* var. *africana, C. fulvotomentosa, Cussonia arborea, Dalbergia nitidula, Dobera loranthifolia, Dombeya rotundifolia, Entada abyssinica, Erythrophleum africanum, Ficus fischeri* subsp. *kiloneura, F. sycomorus* subsp. *sycomorus, Hymenaea verrucosa, Hyphaene coriacea, Margaritaria discoidea* var. *fagifolia, Markhamia zanzibarica, Millettia bussei, M. eetveldeana, M. stuhlmannii, Parinari curatellifolia, Philenoptera bussei, Pseudolachnostylis maprouneifolia, Pteleopsis myrtifolia, Pterocarpus angolensis, P. rotundifolius, Sclerocarya birrea* subsp. *caffra, Steganotaenia araliacea, Vitex payos* var. *payos, Xeroderris stuhlmanni*i, and *Zanha africana.*

Small trees, woody shrubs and lianes are *Alchornea laxiflora, Annona senegalensis, Baphia macrocalyx, Bauhinia petersiana, Carpolobia goetzei, Cassia abbreviata, Cola discoglypremnophylla, Cordia torrei, Cuviera tomentosa, Dalbergia melanoxylon, D.* sp. B of Burrows *et al*. 2018, *Dielsiothamnus divaricatus, Excoecaria bussei, Maerua edulis, M. triphylla* var. *pubescens, Mezoneuron angolense, Monodora grandidieri, Multidentia crassa* var. *crassa, Ormocarpum kirkii, Pseudoprosopis euryphylla, Ritchiea pygmaea, Rourea orientalis, Synaptolepis alternifolia,* and *Tannodia tenuifolia* var. *tenuifolia.*

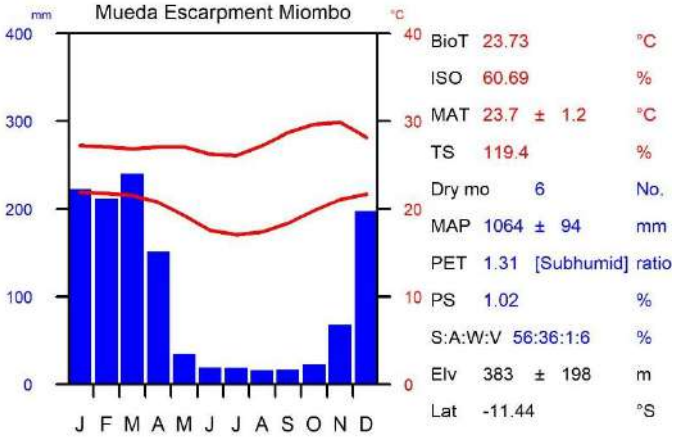
Few species of soft shrubs and herbaceous species have been recorded: *Adenia dolichosiphon, Asparagus cooperi, Dorstenia psilurus, Mimosa pigra, Pseudeminia comosa, Stylochaeton euryphyllus, Vigna unguiculata,* with the few grasses being *Aristida hordeacea, Echinochloa haploclada, Paspalum scrobiculatum, Pennisetum polystachion* subsp. *polystachion,* and *Themeda triandra.*

The steep ravines and sheltered upper semi-forested valleys harbour *Acacia polyacantha* subsp. *campylacantha, Albizia adianthifolia, A. glaberrima* var. *glabrescens, Brachystegia microphylla, Dracaena mannii, Millettia stuhlmannii, Psydrax micans, Rawsonia lucida, Rinorea ferruginea, Sterculia appendiculata, Syzygium cordatum, Trema orientalis, Vitex doniana*, and the rare *Antiaris toxicaria*. As the streams and rivers reach the flatter foothills of the escarpment they are lined by *Acacia nigrescens, A. xanthophloea, Cordyla africana, Faidherbia albida, Ficus sycomorus* subsp. *sycomorus, Kigelia africana, Philenoptera violacea*, and *Tamarindus indica.*

Abiotic environment and climate

Altitude range of 55 to 860 m asl with a mean of 383 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 59.4% while the similarly measured clay content is 25%. Soil pH is 5.9.

Precipitation during driest quarter is 11 mm.



Species of Conservation Importance

Threatened Plant Species

Cuviera tomentosa [EN].

Biogeographic Anomalies

Antiaris toxicaria, Cola discoglypremnophylla and *Cuviera tomentosa* are all rare in Mozambique.

Photographic credits *Left*: escarpment above Mocimboa da Rovoma, Cabo Delgado Province. photo: J. Burrows; *right*: western escarpment of Mueda Plateau, Cabo Delgado Province. photo: J. Burrows.

RLE Assessment

Assessment Summary	Assessment Information
This ecosystem has historical declines with evidence of deforestation & other threats are leading to continuing ongoing declines. **Endangered**	**Criterion A:** Expansion of urban areas, agriculture & deforestation has caused a 37.32% decline since 1750. Least Concern **Criterion B:** This ecosystem has an AOO of 48 10 x 10 km grid cells and an EOO of 6402.26 km2. It has undergone historical decline, and there is evidence that deforestation & other threats are leading to continuing decline. Endangered **Criterion C:** Not evaluated **Criterion D:** Degradation assessment shows that 21.01% of the current distribution faces >90 percent degradation severity, 56.73% of the distribution faces >70 percent degradation severity, and 96.39% of the distribution faces >50 percent degradation severity. Vulnerable **Criterion E:** Not evaluated

NAMETIL MOIST MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Miombo húmido de Nametil
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Zambezian Wet Miombo

Description

Mixed deciduous miombo woodland.

Distribution

From Chalaua in the south, north-east wards through Nametil, to Monapo. Found mostly within Nampula Province.

Characteristic native biota

The main distinction of this vegetation type from the adjacent Mocuba Moist Miombo is the presence in the northern parts of numerous species characteristic of the Rovuma Centre of Endemism to the north, including *Acridocarpus chloropterus, Bosqueiopsis carvalhoana, Buchnerodendron lasiocalyx, Caloncoba welwitschii, Cussonia zimmermannii, Dichapetalum stuhlmannii, Erythrina sacleuxii, Monanthotaxis suffruticosa, Monodora grandidieri, Pavetta lutambensis, Pteleopsis barbosae* and *Triainolepis africana* subsp. *africana.*

This vegetation type is largely miombo woodland dominated by *Brachystegia spiciformis, B. allenii, B. boehmii* and *Julbernardia globiflora* with, like the adjacent Mocuba Moist Miombo, a long list of trees species typically associated with miombo: *Acacia amythethophylla, A. goetzei* (vars. *goetzei* and *microphylla*), *A. sieberiana* var. *woodii, Afzelia quanzensis, Albizia adianthifolia, A. amara* subsp. *amara, A. glaberrima* var. *glaberrima* (riverine), *Amblygonocarpus andongensis, Blighia unijugata, Burkea africana, Cassia abbreviata, Commiphora africana, C. serrata, C. viminea, Dalbergia boehmii, D. fischeri, D. nitidula, Diplorhynchus condylocarpon, Erythrina abyssinica, Erythrophleum africanum, Hirtella zanzibarica, Holarrhena pubescens, Millettia stuhlmannii, Parinari curatellifolia, Pericopsis angolensis, Piliostigma thonningii, Pseudolachnostylis maprouneifolia, Pteleopsis myrtifolia, Pterocarpus angolensis, P. rotundifolius* subsp. *polyanthus, Swartzia madagascariensis, Tabernaemontana elegans, Tetracera boiviniana,* and *Xeroderris stuhlmannii*. The acacias are generally confined to lower lying areas on heavier soils and include *Acacia polyacantha* subsp. *campylacantha, A. adenocalyx, A. gerrardii* var. *gerrardii, A. latistipulata, A. nilotica* subsp. *kraussiana* and *A. robusta.*

Smaller trees and shrubs include *Allophylus rubifolius, Annona senegalensis, Baphia massaiensis, Bauhinia galpinii, B. petersiana, Cassia afrofistula* var. *afrofistula, Cordia torrei, Dalbergia melanoxylon, Dichrostachys cinerea* subsp. *nyassana, Deinbollia borbonica, Diospyros squarrosa, Ehretia amoena, Fernandoa magnifica, Flacourtia indica, Gardenia ternifolia* subsp. *jovis-tonantis, Glyphaea tomentosa, Grevea eggelingii, Grewia micrantha, G. transzambesica, Heinsia crinita* subsp. *parviflora, Hugonia orientalis, Leptactina delagoensis* subsp. *delagoensis, Margaritaria discoidea* var. *triplosphaeria, Millettia mossambicensis, M. usaramensis, Monanthotaxis buchananii, Monodora junodii* var. *macrantha, Mostuea microphylla, Ochna angustata, Olax dissitiflora, Paropsia braunii, Psychotria punctata, Rourea orientalis, Senna petersiana, Synaptolepis oliveriana, Tarenna junodii, Turraea nilotica, Vitex ferruginea, V. mombassae, V. payos, Ximenia caffra and Xylotheca tettensis* var. *macrophylla.*

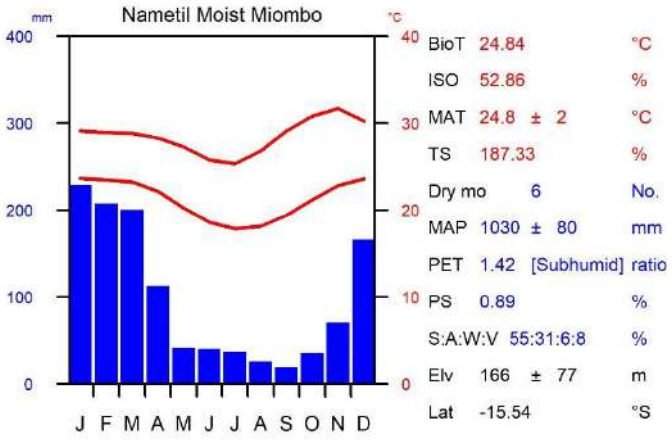
Lianes include *Dalbergia arbutifolia, D. bracteolata, D. fischeri, Entada stuhlmannii* and *Mezoneuron angolensis.*

Rocky hills within this region typically support trees such as *Afzelia quanzensis, Brachystegia bussei, B. torrei, B. utilis, Diplorhynchus condylocarpon, Mundulea sericea* and *Sterculia quinqueloba.*

Abiotic environment and climate

Altitude range of 30 to 321 m asl with a mean of 166 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 67.3% while the similarly measured clay content is 20.5%. Soil pH is 6.3.

Precipitation during driest quarter is 37.5 mm.



Species of Conservation Importance

Endemic Plant Species

Indigofera graniticola [NE].

Threatened Plant Species

Cordia torrei [EN].

RLE Assessment

Assessment Summary

This ecosystem has undergone substantial historical decline, and there is evidence that deforestation & other threats are leading to continuing decline. **Vulnerable**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 40.26% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 227 10 x 10 km grid cells and an EOO of 22633.39 km2. It has undergone substantial historical decline, and there is evidence that deforestation & other threats are leading to continuing decline. Vulnerable

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.32% of the current distribution faces >90 percent degradation severity, 3.83% of the distribution faces >70 percent degradation severity, and 47.83% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

NAMPULA GRANITE ESCARPMENT MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Miombo da escarpa granítica de Nampula
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Zambezian Wet Miombo

Description

Deciduous miombo woodland.

Distribution

Between Canteua or Murrupula and Namapa in Nampula Province.

Characteristic native biota

Note that the vegetation on and surrounding the numerous rocky outcrops, hills and inselbergs which are a feature of this vegetation type are listed under Northern Inselberg Woodland and Northern Inselberg Forest.

The widespread miombo component of this vegetation type is composed of *Brachystegia allenii, B. boehmii, B. spiciformis, B. utilis*, and *Julbernardia globiflora.*

Other trees are *Acacia gerrardii, A. goetzei* subsp. *microphylla, A. latistipulata, A. nigrescens, A. nilotica* subsp. *kraussiana, A. polyacantha* subsp. *campylacantha, A. robusta* subsp. *usambarensis, A. sieberiana, Adansonia digitata, Afzelia quanzensis, Albizia adianthifolia, A. harveyi, A. versicolor, Amblygonocarpus andongensis, Azanza garckeana, Boscia angustifolia* var. *corymbosa, B. mossambicensis, Burkea africana, Cladostemon kirkii, Cleistanthus schlechteri* subsp. *schlechteri, Cleistochlamys kirkii, Combretum adenogonium, C. apiculatum, C. lasiocarpum, C. molle, C. zeyheri, Commiphora mollis, C. serrata, Cussonia arborea, Dalbergia boehmii, D. nitidula, Dalbergiella nyassae, Diospyros mespiliformis, Diplorhynchus condylocarpon, Entada abyssinica, Erythrina abyssinica, E. livingstoniana, Erythrophleum africanum, Ficus bubu, F. bussei, F. lutea, F. sansibarica* subsp. *sansibarica, Garcinia livingstonei, Holarrhena pubescens, Lannea schimperi, Margaritaria discoidea* subsp. *fagifolia,* and subsp. *triplosphaera, Manilkara mochisia, Markhamia obtusifolia, M. zanzibarica, Millettia stuhlmannii, M. usaramensis, Olax dissitiflora, Oxytenanthera abyssinica, Ozoroa reticulata, Pericopsis angolensis, Philenoptera bussei, P. violacea, Phyllocosmus lemaireanus, Piliostigma thonningii, Pseudolachnostylis maprouneifolia, Pteleopsis myrtifolia, Pterocarpus angolensis, P. rotundifolius* subsp. *polyanthus, Pseudolachnostylis maprouneifolia, Pteleopsis myrtifolia, Rauvolfia caffra, Senna obtusifolia, S. petersiana, S. singueana, Sterculia africana, S. quinqueloba, Strychnos madagascariensis, S. potatorum, S. spinosa, Swartzia madagascariensis, Syzygium guineense* subsp. *guineense, Terminalia sericea, Tetracera boiviniana, Trichilia capitata, Uapaca kirkiana, Vitex buchananii, V. mombassae, V. payos* var. *glabrescens, Xeroderris stuhlmannii*, and *Ziziphus abyssinica.*

Riparian woodland includes *Berchemia discolor, Breonadia salicina, Croton megalobotrys, Diospyros mespiliformis, Dracaena mannii, Erythroxylum emarginatum, Ficus sycomorus* subsp. *sycomorus, F. verruculosa, Ixora narcissodora, Khaya anthotheca, Kigelia africana, Parkia filicoidea, Phyllanthus reticulatus, Tabernaemontana elegans, Tamarindus indica, Trichilia emetica*, and the lianes *Dalbergia fischeri, Paullinia pinnata, Saba comorensis*, and *Strophanthus courmontii.*

Small trees and shrubs recorded from this vegetation type are *Abrus precatorius, Afrocanthium racemulosum, Allophylus africanus, A. rubifolius, Annona senegalensis, Artabotrys brachypetalus, Baphia massaiensis* subsp. *gomesii* and subsp. *obovata, Bauhinia galpinii, B. petersiana, Bridelia cathartica* subsp. *melanthioides, B. mollis,*

Buchnerodendron lasiocalyx, Cadaba kirkii, Capparis viminea, Cassia abbreviata subsp. *beareana, Catunaregam taylorii, C. stenocarpa, Chazaliella abrupta, Cola mossambicensis, Coptosperma littorale, Croton pseudopulchellus, Dalbergia melanoxylon, Dichapetalum stuhlmannii, Dichrostachys cinerea* subsp. *nyassana*, subsp. *forbesii*, and subsp. *africana, Dielsiothamnus divaricatus, Diospyros loureiriana, D. squarrosa, Dombeya acutangula, D. shupangae, Dovyalis hispidula, Ehretia amoena, Embelia xylocarpa, Encephalartos turneri, Entada mossambicensis*, *Euclea natalensis* subsp. *obovata, Flacourtia indica, Glyphaea tomentosa, Grewia flavescens* subsp. *flavescens, G. inaequilatera, G. micrantha, G. sulcata, Gymnanthemum myrianthum, Gymnosporia buxifolia, Heinsia crinita* subsp. *parviflora, Heteromorpha arborescens* var. *abyssinica, Hugonia orientalis, Lagynias lasiantha, Leptactina delagoensis, Maerua juncea* subsp. *juncea, M. schliebenii, M. triphylla* var. *pubescens, Mallotus oppositifolius, Maprounea africana, Monanthotaxis buchananii, M. obovata, Monodora grandidieri, Mundulea sericea, Ochna mossambicensis, Ormocarpum kirkii, Pavetta decumbens, Pluchea dioscoridis, Psychotria kirkii, Rothmannia engleriana, Rourea coccinea* subsp. *boiviniana, R. orientalis, Searsia tenuinervis, Synaptolepis alternifolia, Tannodia tenuifolia, Turraea nilotica, Vangueria infausta,* and *Vismia orientalis.*

Soft shrubs and herbaceous species are *Abutilon mauritianum, Acalypha nyasica, Aeschynomene indica, A. minutiflora* subsp. *grandiflora, A. mossambicensis, A. schimperi, Ampelocissus multistriata, Anchomanes abbreviatus, Anisopappus chinensis* var. *dentatus, Asparagus buchananii, A. setaceus, Aspilia kotschyi, Astripomoea malvacea* var. *malvacea, Bidens steppia, Blepharis affinis, Bothriocline steetziana, Brillantaisia riparia, Clerodendrum robustum, C. ternatum, Corchorus aestuans, C. tridens, C. trilocularis, Crinum subcernuum, Crotalaria goodiiformis, C. laburnifolia, C. lanceolata, C. microcarpa, C. natalitia, C. pallida, C. paraspartea, C. reptans, C. schliebenii, C. steudneri, C. vasculosa, C. virgulata* subsp. *virgulata, Desmodium barbatum* var. *procumbens, Disa welwitschii* subsp. *welwitschii, Elachyptera parvifolia, Eminia antennulifera, Eriosema psoraleoides, Eulophia angolensis, E, cucullatus, E. latilabris, E. speciosa, Gladiolus dalenii, G. decoratus, G. unguiculatus, Glinus lotoides* var. *virens, Gloriosa superba, Habenaria zambesina, Haumniastrum villosum, Heterotis prostrata, Hibiscus engleri, H. migoedii, H. physaloides, H. shirensis, H. surattensis, Hygrophila auriculata, Indigofera colutea, I. congesta, I. demissa, I. dendroides, I. nummulariifolia, I. pseudomoniliformis, Jacquemontia tamnifolia, Kabuyea hostifolia, Kalanchoe fernandesii, Lantana ukambensis, Leucas tettensis, Melochia corchorifolia, Neojeffreya decurrens, Nesaea radicans* var. *radicans, Ophrestia radicosa, Pancratium tenuifolium, Physostigma mesoponticum, Platycoryne pervillei, Plectranthus guerkei, P. shirensis, Plumbago zeylanica, Polycarpaea corymbosa, Polygala goetzei, P. sphenoptera, Sida cordifolia, S. pseudocordifolia, S. repens, Siphonochilus aethiopicus, S. kirkii, Smilax anceps, Solanum delagoensis, S. richardii, Tephrosia argyrotricha, T. euchroa, T. faulkneri, T. linearis, T. miranda, T. rhodesica, T. stormsii, T. vogelii, Thunbergia lancifolia, T. petersiana, Trichodesma zeylanicum, Vernonia ugandensis, Vigna reticulata, V. unguiculata* subsp. *dekindtiana,* and *V. vexillata.*

Grasses include *Andropogon canaliculatus, A. eucomus, Brachiaria nigropedata, Chloris virgata, Cleistachne sorghoides, Craspedorhachis africana, Cymbopogon nardus, C. validus, Dactyloctenium aegyptium, Digitaria ciliaris, D. eriantha* subsp. *rogersii, D. perrottetii, Dolichochaete nodiglumis, Echinochloa colona, E. crus-galli, E. frumentacea, Eleusine*

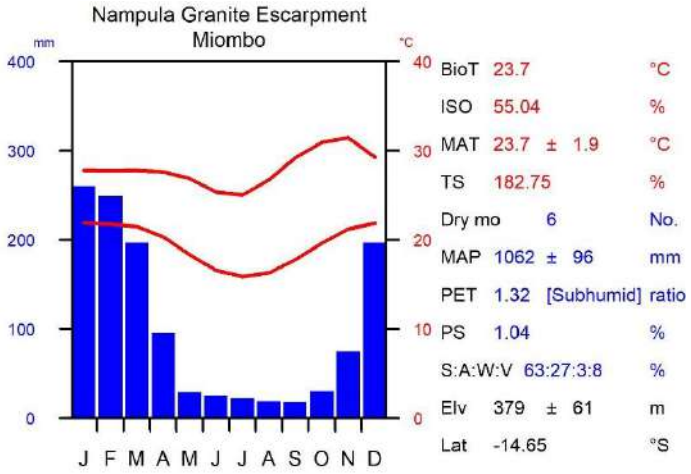
coracana subsp. *africana, E. indica, Eragrostis aspera, E. chapelieri, E. cilianensis, E. ciliaris, E. nindensis, Hackelochloa granularis, Heteropogon contortus, Hyparrhenia familiaris, Hyperthelia dissoluta, Loudetia arundinacea, L. flavida, L. simplex, Melinis repens, Miscanthus ecklonii, Oryza longistaminata, Panicum maximum, P. miliaceum, P. trichocladum, Paspalum scrobiculatum, Pennisetum glaucum, P. polystachion, Perotis leptopus, P. patens, Pogonarthria squarrosa, Rhytachne rottboellioides, Schizachyrium exile, Setaria megaphylla, S. pumila, Tricholaena monachne, Tragus berteronianus, Urelytrum agropyroides,* and *Urochloa mossambicensis*. The few sedges recorded are *Ascolepis speciosa, Cyperus prolifer, Fimbristylis dichotoma, Fuirena ciliaris*, and *Rhynchospora congruloca.*

Climbers and lianes recorded are often in riparian woodland: *Bonamia mossambicensis, Cryptolepis obtusa, Dalbergia arbutifolia, D. dumetorum, Dioscorea hirtiflora* subsp. *orientalis, D. praehensilis, Entada stuhlmannii, Helinus integrifolius, Hewittia scandens, Jasminum stenolobum, Keetia zanzibarica, Landolphia kirkii, Mucuna coriacea* subsp. *irritans, M. pruriens* var. *pruriens*, and var. *utilis, Pyrenacantha kaurabassana, Reissantia buchananii,* and *R. indica.*

Abiotic environment and climate

Altitude range of 250 to 510 m asl with a mean of 379 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 68.1% while the similarly measured clay content is 20.9%. Soil pH is 6.1.

Precipitation during driest quarter is 22.4 mm.



Species of Conservation Importance

Endemic Plant Species

Adenia mossambicensis [E], *Clerodendrum abilioi* [E], *Crotalaria paraspartea* [E*], *Entada mossambicensis* [E*], *Kalanchoe fernandesii* [E], *Momordica mossambica* [E].

Threatened Plant Species

Crotalaria paraspartea [EN*], *Entada mossambicensis* [VU*], *Kalanchoe fernandesii* [DD].

Photographic credits *Left*: Monte Nairuco, Nampula. photo: J. Burrows; *right*: near Nampula. photo: J. Burrows.

RLE Assessment

Assessment Summary

This ecosystem has undergone substantial historical decline, and there is evidence that deforestation & other threats are leading to continuing decline. **Vulnerable**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 44.78% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 241 10 x 10 km grid cells and an EOO of 26979.75 km2. It has undergone substantial historical decline, and there is evidence that deforestation & other threats are leading to continuing decline. Vulnerable

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.91% of the current distribution faces >90 percent degradation severity, 4.14% of the distribution faces >70 percent degradation severity, and 48.56% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

NUNGO MOIST MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Miombo húmido de Nungo
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Zambezian Wet Miombo

Description

Deciduous miombo woodland.

Distribution

In northern Mozambique, from Metarica to Catua. Occurring in Cabo Delgado and Niassa Provinces.

Characteristic native biota

The miombo woodland is dominated by *Julbernardia globiflora, Brachystegia spiciformis, B. boehmii, B. utilis* and, on rocky, hilly ground, *Brachystegia bussei* and *B. manga.*

Other trees recorded are *Acacia amythethophylla, A. goetzei* subsp. *microphylla, A. nigrescens, A. sieberiana, Afzelia quanzensis, Boscia angustifolia* var. *corymbosa, B. salicifolia, Brackenridgea zanguebarica, Burkea africana, Cassia abbreviata, Combretum adenogonium, C. apiculatum, C. collinum, C. imberbe, C. molle, Commiphora mossambicensis, Crossopteryx febrifuga, Dalbergia nitidula, Dalbergiella nyassae, Diospyros kirkii, D. truncatifolia, Diplorhynchus condylocarpon, Entada abyssinica, Erythrophleum africanum, Garcinia livingstonei, Hirtella zanzibarica, Hymenocardia ulmoides, Lannea schweinfurthii, Millettia bussei, M. stuhlmannii, Monotes engleri, Olax dissitiflora, Parinari curatellifolia, Pericopsis angolensis, Philenoptera bussei, Piliostigma thonningii, Pseudolachnostylis maprouneifolia, Schrebera trichoclada, Sclerocarya birrea* subsp. *caffra, Sterculia quinqueloba, Syzygium guineense* subsp. *guineense, Strychnos madagascariensis, S. spinosa, Swartzia madagascariensis, Terminalia sericea, Uapaca kirkiana, U. nitida, Vitex payos, Xeroderris stuhlmannii,* and *Zanha africana.*

Small trees and woody shrubs include *Annona senegalensis, Bauhinia galpinii, B. petersiana, Combretum psidioides* subsp. *psidioides, Dalbergia melanoxylon, Dichrostachys cinerea* subsp. *nyassana, Diospyros loureiriana, Elephantorrhiza goetzei, Euphorbia marrupana, Flacourtia indica, Gymnosporia buchananii, G. senegalensis, Monanthotaxis buchananii, M. obovata, Ormocarpum kirkii, Protea gaguedi, P. madiensis* subsp. *madiensis, P. welwitschii, Psorospermum febrifugum, Rothmannia engleriana, Rourea orientalis, Senna petersiana, Synaptolepis alternifolia, Uvaria lucida*, and *Xylopia parviflora.*

Small shrubs and herbaceous species: *Aeschynomene schliebenii, Anisopappus chinensis* var. *buchwaldii, Cissus cornifolia, Crotalaria cephalotes, C. juncea, Droogmansia pteropus, Gladiolus murielae, Indigofera antunesiana, I. emarginella* var. *emarginella, I. emarginella* var. *marrupaensis, Physostigma mesoponticum, Rhynchosia viscosa*, and *Xerophyta pseudopinnifolia.*

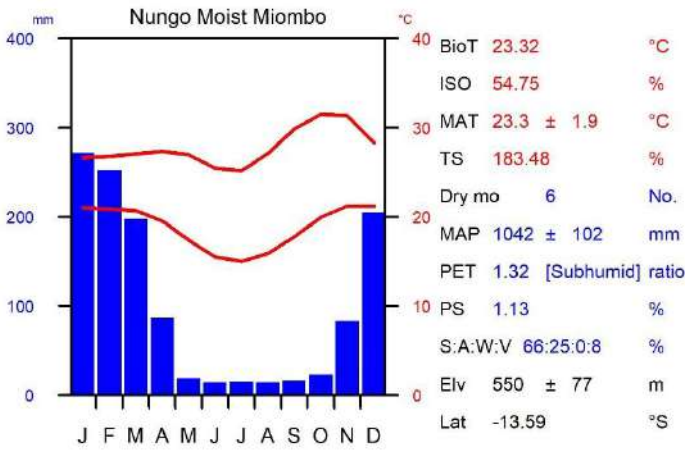
Some grasses recorded are *Bewsia biflora, Eragrostis ciliaris, E. nindensis, Hyperthelia dissoluta, Leptocarydion vulpiastrum, Melinis amethystea, Panicum coloratum, Pogonarthria squarrosa, Sacciolepis indica, Stereochlaena cameronii, Themeda triandra, Tristachya rehmannii,* and *Zonotriche inamoena.*

Riparian vegetation is characterized by *Albizia versicolor, Bridelia micrantha, Erythrophleum suaveolens, Kigelia africana, Milicia excelsa, Parkia filicoidea, Philenoptera violacea, Pteleopsis myrtifolia, Raphia farinifera, Sterculia appendiculata, Tabernaemontana elegans, Tamarindus indica, Treculia africana, Voacanga africana.* Riparian lianes include *Combretum paniculatum, Keetia zanzibarica* subsp. *cornelioides, Paullinia pinnata*, and *Saba comorensis.*

Abiotic environment and climate

Altitude range of 400 to 700 m asl with a mean of 550 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 64.4% while the similarly measured clay content is 21.6%. Soil pH is 5.9.

Precipitation during driest quarter is 3.9 mm.



Species of Conservation Importance

Endemic Plant Species

Euphorbia marrupana [E].

Threatened Plant Species

Euphorbia marrupana [EN].

RLE Assessment

Assessment Summary

This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 9.99% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 239 10 x 10 km grid cells and an EOO of 27233.18 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.04% of the current distribution faces >90 percent degradation severity, 0.81% of the distribution faces >70 percent degradation severity, and 11.63% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

PEBANE SANDY SHRUB MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Miombo arbustivo arenoso de Pebane
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Zambezian Wet Miombo

Description

A dense to open deciduous miombo woodland on coastal sands.

Distribution

From Nicuadala in Zambezia Province, to just south of Angoche in Nampula Province.

Characteristic native biota

A dense to open miombo woodland on sands dominated by *Brachystegia spiciformis, B. boehmii,* and *Julbernardia globiflora*, with *Brachystegia oblonga* being a rare component.

Other typical trees are *Acacia goetzei* subsp. *microphylla, A. polyacantha* subsp. *campylacantha* (in lower drainage lines), *A. sieberiana* var. *woodii, Afzelia quanzensis, Albizia adianthifolia, A. versicolor, Amblygonocarpus andongensis, Boscia mossambicensis, Brackenridgea zanguebarica, Burkea africana, Combretum adenogonium, C. collinum, C. molle, C. zeyheri, Cordia stuhlmannii, Dalbergia nitidula, Diospyros kirkii, Ekebergia benguelensis, Entada abyssinica, Erythrophleum africanum, Hirtella zanzibarica, Hymenocardia ulmoides, Lannea schimperi, Millettia stuhlmannii, M. usaramensis* subsp. *australis, Parinari curatellifolia, Pericopsis angolensis, Philenoptera bussei, P. violacea, Pseudolachnostylis maprouneifolia, Pterocarpus angolensis, P. rotundifolius* subsp. *polyanthus, Sclerocarya birrea* subsp. *caffra, Sterculia quinqueloba, Strychnos madagascariensis, Swartzia madagascariensis, Tetracera boiviniana, Uapaca kirkiana,* and *Xeroderris stuhlmannii.*

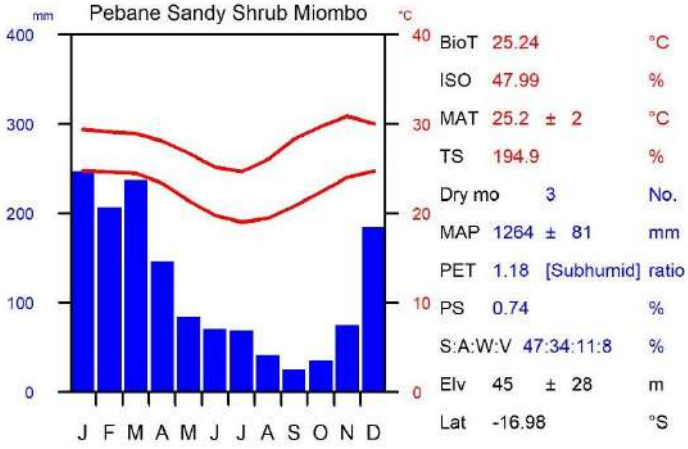
Small trees, woody shrubs and climbers include *Alchornea laxiflora, Annona senegalensis, Artabotrys brachypetalus, Bauhinia galpinii, Cuviera schliebenii, Dalbergia lactea, D. melanoxylon, Dichrostachys cinerea* subsp. *nyassana, Diospyros verrucosa, Elephantorrhiza goetzei, Erica simii, Flacourtia indica, Grewia flavescens* var. *flavescens, G. transzambesica, Hugonia orientalis, Maerua scandens, Maprounea africana, Monanthotaxis buchananii, Mostuea microphylla, Mundulea sericea, Psychotria kirkii, Rotheca myricoides* subsp. *myricoides, Rourea orientalis, Tarenna longipedicellata, Uvaria acuminata,* and *Xylopia parviflora*. Smaller shrubs and herbaceous species include *Aeschynomene cristata, A. mossambicensis, A. nodulosa, Crotalaria hyssopifolia, Eriosema psoraleoides, Polystachya dendrobiiflora, Siphonochilus kilimanensis*, and *Tinospora caffra.*

Drainage lines and rivers through this region support a riparian forest of *Albizia glaberrima* subsp. *glabrescens, Burttdavya nyasica, Cassipourea malosana, Diospyros natalensis, Margaritaria discoidea* var. *fagifolia, Mascarenhasia arborescens, Pandanus livingstonianus, Parkia filicoidea, Pteleopsis myrtifolia, Synsepalum brevipes,* and *Vitex doniana.*

Abiotic environment and climate

Altitude range of 5 to 125 m asl with a mean of 44 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 67.7% while the similarly measured clay content is 18.7%. Soil pH is 6.2.

Precipitation during driest quarter is 50.3 mm.



Species of Conservation Importance

Endemic Plant Species

Brachystegia oblonga [E], *Cordia stuhlmannii* [NE], *Hugonia elliptica* [E], *Siphonochilus kilimanensis* [NE], *Tarenna longipedicellata* [NE), *Triceratella drummondii* [E*].

Threatened Plant Species

Brachystegia oblonga [CR], *Cordia stuhlmannii* [VU], *Siphonochilus kilimanensis* [VU], *Tarenna longipedicellata* [VU], *Triceratella drummondii* [CR*].

Photographic credits *Left*: west of Olinga/Maganja da Costa, Zambezia Province. photo: J. Burrows; *right*: near Gobene, Zambezia Province. photo: M. Lotter

RLE Assessment

Assessment Summary

This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 49.75% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 136 10 x 10 km grid cells and an EOO of 16137.55 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.5% of the current distribution faces >90 percent degradation severity, 5.96% of the distribution faces >70 percent degradation severity, and 55.71% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

RIBAUE GRANITE ESCARPMENT MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Miombo da escarpa granítica do Ribáuè
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Zambezian Wet Miombo

Description

Deciduous miombo woodland occurring among numerous granite outcrops, hills and mountains.

Distribution

Situated between Namicuna, Alto Ligonha, and Mecuburi in Zambezia and Nampula provinces.

Characteristic native biota

The miombo element of this woodland is composed of *Brachystegia allenii, B. boehmii, B. longifolia, B. manga, B. spiciformis, B. utilis* and *Julbernardia globiflora.* Other trees recorded are *Acacia amythethophylla, A. erubescens, A. goetzei* subsp. *goetzei* and subsp. *microphylla, A. nilotica* subsp. *kraussiana, A. polyacantha* subsp. *campylacantha, A. sieberiana* var. *sieberiana, Afzelia quanzensis, Albizia adianthifolia, A. anthelmintica, A. antunesiana, A. harveyi, A. versicolor, Amblygonocarpus andongensis, Antidesma venosum, Baphia massaiensis* subsp. *gomesii, Combretum adenogonium, C. molle, C. zeyheri, Commiphora africana* var. *rubriflora, Cussonia arborea, Dalbergia boehmii, D. nitidula, Diospyros kirkii, Erythrina abyssinica, Erythrophleum africanum, Ficus sycomorus* subsp. *gnaphalocarpa, Hirtella zanzibarica, Maerua schliebenii, Olax dissitiflora, O. obtusifolia, Parinari curatellifolia, Pericopsis angolensis, Philenoptera bussei, P. violacea, Pseudolachnostylis maprouneifolia, Pterocarpus angolensis, P. rotundifolius* subsp. *polyanthus, Protea gaguedi, Millettia stuhlmannii, Parinari curatellifolia, Uapaca nitida*, and *Vitex payos.*

Small trees and woody shrubs: *Annona senegalensis, Artabotrys brachypetalus, Baphia massaiensis, Bauhinia petersiana, Coptosperma littorale, Cuviera schliebenii, Dalbergia melanoxylon, Dichrostachys cinerea* subsp. *tanganyikensis, Diospyros verrucosa, Elephantorrhiza goetzei, Euphorbia decliviticola, Gymnosporia szyszylowiczii, Hugonia orientalis, Mundulea sericea, Pavetta crassipes, P. gardeniifolia, Psorospermum febrifugum, Psydrax livida, Rothmannia engleriana,* and *Rourea orientalis.* Geoxylic suffrutices (underground trees or geoxyles) include *Cryptosepalum maraviense, Lannea edulis,* and *Rotheca wildii*.

Semi-woody shrubs and herbaceous species: *Acalypha chirindica, Aeschynomene abyssinica, A. minutiflora, A. nyassana, Ammocharis tinneana, Chamaecrista grantii, Cissus cornifolia, Clerodendrum robustum, Commelina bracteosa, Costus macranthus, Crotalaria anthyllopsis, C. hyssopifolia C. juncea, C. laburnoides, C. lanceolata, C. shirensis, C. virgulata* subsp. *forbesii, Cynanchum oresbium, Dioscorea dumetorum, Dolichos kilimandscharicus, Eulophia livingstoniana, Euphorbia neopedunculata, Exacum oldenlandioides, Glossostelma carsonii, Haumaniastrum venosum, Leonotis ocymifolia* var. *raineriana, Leucas tettensis, Moraea natalensis, Nervilia kotschyi, N. shirensis, Pycnostachys ciliata, Raphionacme grandiflora, Rhynchosia luteola, Sphenostylis erecta, Stathmostelma spectabile, Stomatostemma pendulina, Tacca leontopetaloides, Tephrosia argyrotricha, T. linearis, T. paradoxa, T. reptans* var. *reptans, Tricliceras auriculatum, Vigna platyloba, Wahlenbergia abyssinica* subsp. *abyssinica*, and *W. capitata.*

Grasses recorded are *Alloteropsis paniculata, Andropogon canaliculatus, A. eucomus, A. gayanus* var. *polycladus, Aristida adscensionis, Bewsia biflora, Cenchrus perinvolucratus, Chloris virgata, Cleistachne macrantha, Coelorachis afraurita, Cynodon dactylon, Digitaria sanguinalis, Diheteropogon amplectens, Eragrostis aspera, E. chapelieri, E.*

ciliaris, Hackelochloa granularis, Heteropogon contortus, Hyparrhenia familiaris, H. lecomtei, Hyperthelia dissoluta, Leptocarydion vulpiastrum, Loudetia simplex, Microchloa indica, Mnesithea laevis, Panicum atrosanguineum, Panicum laticomum, P. parvifolium, P. trichocladum, Paspalum scrobiculatum, Pennisetum polystachion subsp. *polystachion, Pogonarthria squarrosa, Rottboellia cochinchinensis, Sacciolepis spiciformis, Sorghum arundinaceum, Sporobolus consimilis, S. pyramidalis, Stereochlaena cameronii, Themeda triandra,* and *Tragus berteronianus.*

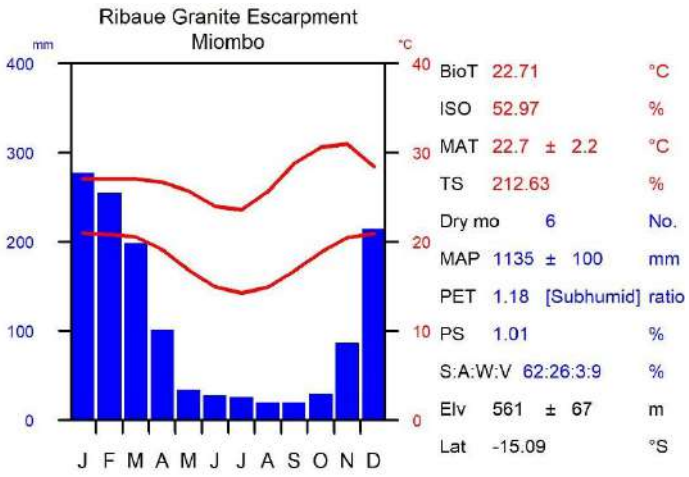
Riparian and inselberg foothills forest are composed of *Albizia glaberrima* subsp. *glabrescens, Antidesma membranaceum, Canarium madagascariense, Cleistanthus schlechteri, Dombeya burgessiae, Mascarenhasia arborescens, Monanthotaxis chasei, Parkia filicoidea, Rytigynia decussata, Trichilia dregeana,* with associated creepers and lianes such as *Asparagus falcatus, Dalbergia fischeri, D. lactea, Entada stuhlmannii, Keetia zanzibarica,* and *Mezoneuron angolense.*

Granite hills and outcrops support *Actiniopteris dimorpha, Albizia tanganyicensis, Aloe mawii, Baptorhachis foliacea, Brachystegia microphylla, Euphorbia contorta, E. decliviticola, Ficus glumosa, Myrothamnus flabellifolius, Searsia acuminatissima, Strophanthus hypoleucus, Xerophyta scabrida,* and *X. suaveolens* var. *suaveolens.*

Abiotic environment and climate

Altitude range of 400 to 700 m asl with a mean of 561 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 69.0% while the similarly measured clay content is 19.5%. Soil pH is 5.9.

Precipitation during driest quarter is 29.5 mm.



Species of Conservation Importance

Endemic Plant Species

Baptorhachis foliacea [E], *Tragia shirensis* var. *glabriuscula* [E], *Tricliceras auriculatum* [E].

Threatened Plant Species

Baptorhachis foliacea [DD], *Tricliceras auriculatum* [DD].

Photographic credits Ribaue Mt and surrounding woodland, Nampula Province. photo: J. Burrows.

RLE Assessment

Assessment Summary

This ecosystem has a highly restricted distribution with evidence of considerable historical declines, and deforestation & other threats are leading to continuing ongoing declines. **Endangered**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 42.88% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 148 10 x 10 km grid cells and an EOO of 15220.83 km2. It has undergone historical decline, and there is evidence that deforestation & other threats are leading to continuing decline. Endangered

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.66% of the current distribution faces >90 percent degradation severity, 5.64% of the distribution faces >70 percent degradation severity, and 48.1% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

ROVUMA COASTAL MOIST MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Miombo húmido costeiro do Rovuma
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Zambezian Wet Miombo

Description

Comprising a mixture of tall open miombo woodland with mixed woodland, occasionally forming a mosaic with dry coastal forest and small islands of species-rich semi-deciduous forest on old termitaria, and small freshwater depressions.

Distribution

In Northern Mozambique, from Pundanhar to just south of Diaca in Cabo Delgado Province.

Characteristic native biota

The woodland component of this vegetation type is characterized by *Brachystegia spiciformis, Julbernardia globiflora, Berlinia orientalis, Hirtella zanzibarica, Hymenaea verrucosa, Manilkara sansibarensis, Parinari curatellifolia, Pteleopsis myrtifolia, Pterocarpus angolensis, Uapaca sansibarica,* and *U. nitida,* Additional tree species present are *Albizia versicolor, Balanites maughamii, Brachystegia boehmii, Brackenridgea zanguebarica, Cladostemon kirkii, Cleistanthus schlechteri* var. *schlechteri, Commiphora pteleifolia, Maprounea africana, Pseudolachnostylis maprouneifolia, Tetracera boiviniana, Vangueria randii* subsp. *vollesenii* and the palm *Hyphaene compressa*. The rare tree legume, *Scorodophloeus fischeri* forms a few isolated but almost pure stands within this vegetation type.

Shrubs and small trees include *Bridelia cathartica, Erythroxylum polycladus, Fernandoa magnifica, Gymnosporia buchananii, Mimosa busseana, Mundulea sericea, Olax dissitiflora, Pancovia holtzii* subsp. *holtzii, Pavetta macrosepala, Polysphaeria multiflora, Psorospermum febrifugum, Rotheca myricoides* subsp. *myricoides* var. *discolor, Tapiphyllum velutinum*, and *Ximenia caffra* subsp. *natalensis.* Open areas in this woodland support three geoxylic suffrutices: *Clerodendrum lutambense, Millettia makondensis* and *Rotheca incisa.*

A feature of this vegetation type are the numerous small patches of species-rich, semi-deciduous forest developed on ancient termite mounds. These forest patches essentially belong to Rovuma Basin Coastal Forest (see under that unit for a more detailed description) but here typically support canopy trees such as *Albizia versicolor, Cassipourea mossambicensis, Hymenaea verrucosa, Afzelia quanzensis* and the palm *Phoenix reclinata*. The understorey is typically composed *Casearia celastroides, Eugenia verdcourtii, Garcinia acutiloba, Strychnos myrtoides* and a very rich array of the family Rubiaceae: *Chassalia colorata, C. umbraticola, Chazaliella abrupta* var. *abrupta, Cremaspora triflora* subsp.

confluens, Coffea schliebenii, Didymosalpinx callianthus, Gardenia transvenulosa, Leptactina papyrophloea, Oxyanthus biflorus, O. strigosus, Triainolepis africana subsp. *hildebrandtii, Tricalysia coriacea* subsp. *nyassae, T. semidecidua* and *Vangueria domatiosa.*

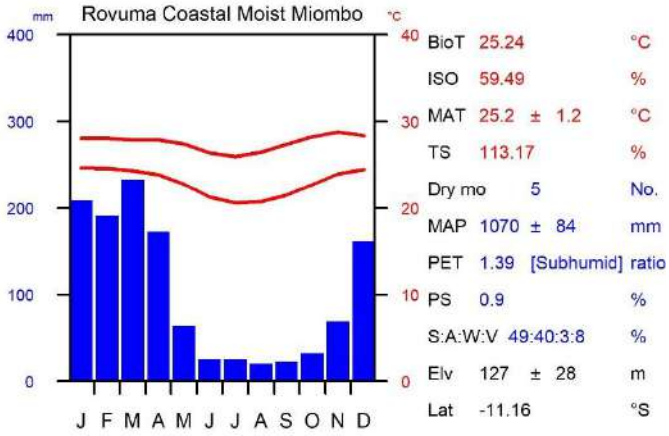
Species making up patches of dense thicket include *Combretum butyrosum, Crossopetalum mossambicensis, Erythroxylum emarginatum, Coptosperma supra-axillare, Homalium longistylum, Monanthotaxis buchananii, Nectaropetalum carvalhoi, Pentarhopalopilia umbellulata, Psydrax micans, Ritchiea capparoides* var. *capparoides, Rourea coccinea* subsp. *boiviniana, Sphaerocoryne gracilis, Vitex franceseana* and *Xylopia collina.*

The grassy wetland vegetation surrounding the pans within this vegetation type has not been investigated and documented.

Abiotic environment and climate

Altitude range of 55 to 210 m asl with a mean of 127 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 68.6% while the similarly measured clay content is 18.2%. Soil pH is 5.9.

Precipitation during driest quarter is 26.8 mm.



Species of Conservation Importance

Endemic Plant Species

Chassalia colorata [NE], *Coffea schliebenii* [NE*], *Didymosalpinx callianthus* [NE], *Convolvulus goyderi* [NE], *Oxyanthus biflorus* [NE], *Oxyanthus strigosus* [NE], *Pavetta macrosepala* var. *macrosepala* [NE], *Vangueria domatiosa* [E].

Threatened Plant Species

Chassalia colorata [EN], *Coffea schliebenii* [VU*], *Didymosalpinx callianthus* [EN], *Ipomoea* sp. nov. [EN*], *Leptactina papyrophloea* [EN], *Nectaropetalum carvalhoi* [VU], *Oxyanthus strigosus* [EN], *Pavetta macrosepala* var. *macrosepala* [VU], *Vangueria domatiosa* [EN].

Biogeographic Anomalies

This vegetation type supports a rich array of species that occur only in this corner of Cabo Delgado, many of which are local endemics or are southern extensions of species more common in adjacent Tanzania. Some are *Casearia celastroides, Chassalia umbraticola, Crossopetalum mossambicensis, Garcinia acutiloba, Gardenia transvenulosa, Homalium longistylum, Leptactina papyrophloea, Millettia makondensis, Mimosa busseana, Nectaropetalum carvalhoi, Scorodophloeus fischeri,* and *Vitex franceseana.*

Photographic credits *Top*: Nhica do Rovuma turnoff, west of Palma. photo: J. Burrows; *bottom left*: wetland pan, Palma to Pundanhar, Cabo Delgado Province. photo: J. Burrows; *bottom right*: Palma to Pundanhar, Cabo Delgado Province. photo: M. Lotter.

RLE Assessment

Assessment Summary

This ecosystem has a restricted geographic distribution but there is little evidence of ongoing declines in extent. However, moderate degradation levels are present across most of the distribution of the ecosystem. **Vulnerable**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 11.63% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 31 10 x 10 km grid cells and an EOO of 3047.81 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 17.01% of the current distribution faces >90 percent degradation severity, 39.34% of the distribution faces >70 percent degradation severity, and 93.48% of the distribution faces >50 percent degradation severity. Vulnerable

Criterion E: Not evaluated

ZUMBO MONTANE MIOMBO

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Miombo de Montana do Zumbo
Biome Savannas and grasslands (T4)
Functional group Pyric tussock savannas (T4.2)
Regional Ecosystem Zambezian Wet Miombo

Description

Mixed high-elevation deciduous miombo woodland with pockets of bamboo (*Oxytenanthera abyssinica*), which have not been mapped.

Distribution

Mountainous area of Zumbo and Maravia, above 900 m, in northern Mozambique north of Cahora Bassa Dam. Occurring in Tete Province. Extending into Zambia.

Characteristic native biota

A poorly known and surveyed area but the following species are recorded from this area. Of importance is the occurrence of the high-elevation (above 900 m) *Brachystegia floribunda* and *Julbernardia paniculata* miombo elements. Other species include *Brachystegia spiciformis, B. boehmii, B. bussei, B. stipulata, Julbernardia globiflora, Bauhinia petersiana, Combretum molle, Dalbergia boehmii, Diplorhynchus condylocarpon, Piliostigma thonningii, Parinari curatellifolia, Pericopsis angolensis, Protea* spp., *Pseudolachnostylis maprouneifolia, Pterocarpus angolensis, Searsia longipes, Syzygium guineense, Swartzia madagascariensis, Terminalia sericea, Uapaca kirkiana*, and *U. nitida.*

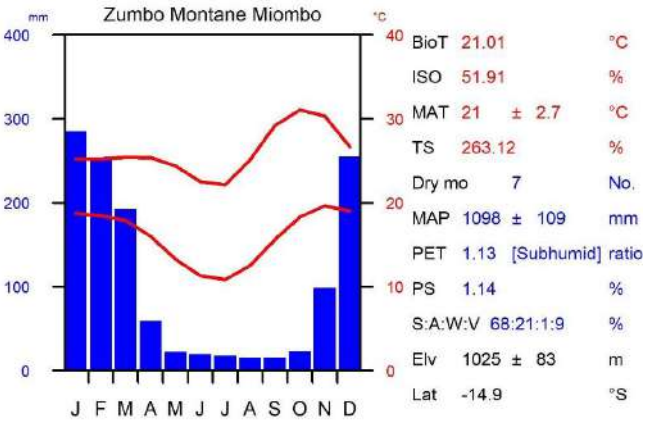
Shrubs and ground flora: *Eminia antennulifera, Aeschynomene* sp., *Crotalaria cleomifolia, Cryptosepalum maraviense, Eriosema englerianum, Eminia antennulifera, Rhynchosia resinosa, Sphenostylis erecta,* and *Eriosema englerianum.*

Grasses noted are *Urochloa mosambicensis, Hyparrhenia dichroa, H. filipendula, Loudetia simplex,* with pockets of bamboo (*Oxytenanthera abyssinica*).

Abiotic environment and climate

Altitude range of 900 to 1260 m asl with a mean of 1024 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 60.6% while the similarly measured clay content is 24.4%. Soil pH is 5.9.

Precipitation during driest quarter is 9.1 mm.



Species of Conservation Importance: none recorded.

Photographic credits Between Bene & Fingoe, Tete Province. photo: J. Burrows.

RLE Assessment

Assessment Summary

This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 23.44% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 106 10 x 10 km grid cells and an EOO of 15585.27 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0% of the current distribution faces >90 percent degradation severity, 0.42% of the distribution faces >70 percent degradation severity, and 24.28% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

T4.5 Temperate subhumid grasslands

CHIMANIMANI MONTANE GRASSLAND

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Pradaria de montanha de Chimanimani
Biome Savannas and grasslands (T4)
Functional group Temperate subhumid grasslands (T4.5)
Regional Ecosystem Eastern Highlands Grassland

Description

Short montane grassland on quartzite, in flat or rocky areas, usually above 1250 m asl.

Distribution

The summit of the Chimanimani Mountains in Mozambique and Zimbabwe. Occurring in Manica Province.

Characteristic native biota

Grasslands, on nutrient-deficient quartzite soils, with *Loudetia simplex* dominant, together with *Sporobolus festivus, Panicum brazzavillense, Elionurus muticus, Melinis nerviglumis, Monocymbium ceresiiforme, Panicum ecklonii, Rhytachne rottboellioides, Trachypogon spicatus*. On redder gneiss/schist soils grow *Loudetia simplex, Themeda triandra, Tristachya hispida, Monocymbium ceresiiforme* and *Bulbostylis contexta*.

The grasslands support a rich non-graminoid flora of pyrophytic shrublets, forbs and geophytes, including *Aeschynomene aphylla, A. grandistipulata, A. nodulosa, A. semilunaris, Afrosciadium rhodesicum, Aspidoglossum glabellum, Antherotoma* spp., *Chamaecrista polytricha* var. *pauciflora, Crotalaria phylicoides, Dierama plowesii, Diplolophium buchananii, Disa chimanimaniensis, D. fragrans, Erica* spp., *Eriosema shirense, Gerbera ambigua, Gnidia microcephala, Haumaniastrum villosum, Helichrysum kraussii, H. nitens, Indigofera hilaris, Laggera crispata, Lantana swynnertonii, Lasiosiphon kraussianus, Polygala zambesiaca, Rhynchosia chimanimaniensis, R. monophylla, R.*

stipata, Vigna gazensis and *Zaluzianskya tropicalis.* The fire-tolerant tree *Protea caffra* subsp. *gazensis* occurs in patches within the grasslands, as does the common bracken fern *Pteridium aquilinum* subsp. *caffrum*.

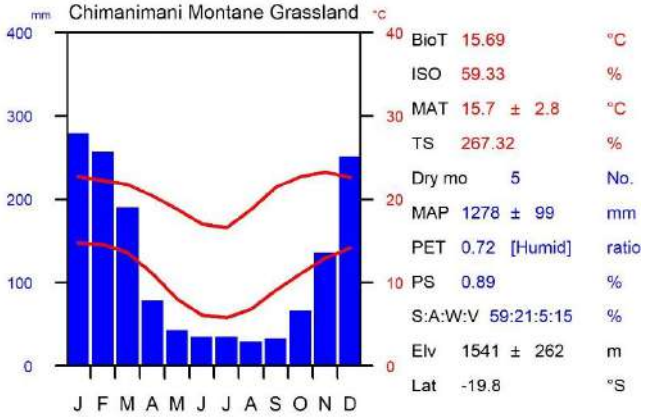
The grasslands are also home to three endemic geoxylic suffrutices: *Morella chimanimaniana*, *Olea chimanimani* and *Protea enervis*.

The numerous rocky outcrops shelter more fire-sensitive species such as *Anthospermum vallicola, Asparagus chimanimaniensis, Canthium oligocarpum subsp. angustifolium, Empogona jenniferae, Impatiens cecilii, I. salpinx, Kniphofia splendida, Leucospermum saxosum* (pictured), *Olinia chimanimani, Podocarpus latifolius, Tephrosia* spp. and *Widdringtonia nodiflora*.

Abiotic environment and climate

Altitude range of 1250 to 2180 m asl with a mean of 1541 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 46.9% while the similarly measured clay content is 31.4%. Soil pH is 5.8.

Precipitation during driest quarter is 82.5 mm.



Species of Conservation Importance

Endemic Plant Species

Aeollanthus viscosus [NE], *Aeschynomene chimanimaniensis* [NE], *Aloe hazeliana* var. *hazeliana* [NE], *Aloe hazeliana* var. *howmanii* [NE], *Aloe munchii* [NE], *Aloe plowesii* [NE*], *Aloe wildii* [NE], *Anisopappus paucidentatus* [NE], *Asclepias graminifolia* [NE], *Asparagus chimanimanensis* [NE], *Aspidoglossum glabellum* [NE*], *Aster chimanimaniensis* [NE], *Bersama swynnertonii* [NE], *Buchnera subglabra* [NE*], *Centella obtriangularis* [E*], *Ceropegia chimanimaniensis* [NE], *Chlorophytum pygmaeum* subsp. *rhodesianum* [NE], *Clutia sessilifolia* [NE], *Coleus caudatus* [NE], *Danthoniopsis chimanimaniensis* [E], *Dianthus chimanimaniensis* [E*], *Dierama plowesii* [NE*], *Disa chimanimaniensis* [NE], *Empogona jenniferae* [NE*], *Eragrostis desolata* [NE], *Erica lanceolifera* [NE*], *Erica pleiotricha* var. *blaeriodes* [NE], *Erica wildii* [NE], *Eriospermum mackenii* subsp. *phippsii* [NE], *Euphorbia crebrifolia* [NE], *Helichrysum moorei* [NE], *Helichrysum rhodellum* [NE], *Hesperantha ballii* [NE], *Impatiens salpinx* [NE], *Kalanchoe velutina* subsp. *chimanimanensis* [NE], *Lobelia cobaltica* [NE], *Lopholaena brickellioides* [NE], *Mesanthemum africanum* [E], *Morella chimanimaniana* [E], *Neobolusia ciliata* [NE*], *Oldenlandia cana* [NE], *Olea chimanimani* [NE], *Olinia chimanimani* [NE*], *Otiophora inyangana* subsp. *parvifolia* [NE], *Pearsonia mesopontica* [NE], *Plectranthus caudatus* [NE], *Protea enervis* [NE*], *Rhynchosia stipata* [NE], *Selago anatrichota* [NE], *Senecio aetfatensis* [NE], *Sphenostylis zimbabweensis* [NE], *Streptocarpus montis-bingae* [E], *Syncolostemon flabellifolius* [E], *Syncolostemon oritrephes* [NE*], *Tephrosia longipes* var. *drummondii* [NE], *Thesium bundiense* [E], *Thesium chimanimaniense* [NE], *Thesium pygmaeum* [NE], *Vernonia nepetifolia* [NE], *Xyris asterotricha* [NE*].

Threatened Plant Species

Aloe plowesii [VU*], *Aspidoglossum glabellum* [EN*], *Buchnera subglabra* [VU*], *Centella obtriangularis* [VU*], *Dianthus chimanimaniensis* [VU*], *Dierama plowesii* [VU*], *Empogona jenniferae* [EN*], *Erica lanceolifera* [VU*], *Neobolusia ciliata* [EN*], *Olinia chimanimani* [EN*], *Protea enervis* [VU*], *Syncolostemon oritrephes* [VU*], *Xyris asterotricha* [VU*].

Biogeographic Anomalies

Leucospermum saxosum, with outlier population in Mpumalanga escarpment (South Africa).

Photographic credits *Left*: Chimanimani summit grasslands with *Leucospermum saxosum*. photo: S. Dondeyene. Chimanimani grasslands. photo: J. Timberlake.

RLE Assessment

Assessment Summary

This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. However, there is evidence that climate change will greatly reduce climatically suitable area in the future. **Endangered**.

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 2.03% decline since 1750, and this ecosystem is assessed as Least Concern under A3. However, Future climate models also predict declines in suitable climate of 52-78% between 2000 & 2050. As such this ecosystem is assessed as endangered under A2a.

Criterion B: This ecosystem has an AOO of 11 10 x 10 km grid cells and an EOO of 769.74 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0% of the current distribution faces >90 percent degradation severity, 0% of the distribution faces >70 percent degradation severity, and 1.52% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

GORONGOSA MONTANE GRASSLAND

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Pradaria de montanha da Gorongosa
Biome Savannas and grasslands (T4)
Functional group Temperate subhumid grasslands (T4.5)
Regional Ecosystem Eastern Highlands Grassland

Description

Montane grassland occurring mostly as large glades within the Central Submontane Forest and Central Montane Forest on gentle to moderate slopes at elevations above 1300 m. The transition from forest to grassland is mostly abrupt with a very sharply defined ecotone.

Distribution

Gorongosa Mountain, Sofala Province.

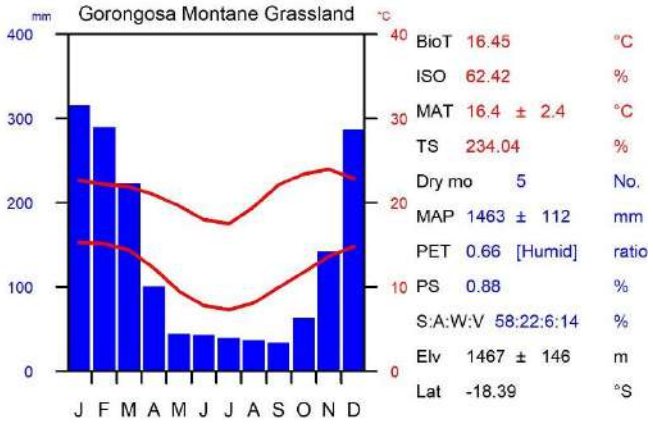
Characteristic native biota

Typical grasses are *Eragrostis volkensii, Eulalia villosa, Panicum ecklonii, Setaria sphacelata, Andropogon schirensis, Digitaria maitlandii, Ischaemum fasciculatum, Trichopteryx dregeana, Loudetia simplex* and *Monocymbium ceresiiforme*. Forbs make up an important portion of the ground cover and the most common species are *Helichrysum buchananii, Helichrysum nitens* and *Vernonia natalensis*. Other common species are *Eriosema psoraleoides, Haumaniastrum venosum, Indigofera hedyantha, Kotschya thymodora, Lotus wildii, Rhynchosia clivorum* and *Sopubia mannii, Alepidea swynnertonii, Aloe rhodesiana, Gladiolus crassifolius, Kniphofia linearifolia, Ranunculus transvaalensis, Sebaea leiostyla* and *Jamesbrittenia carvalhoi*. The fern, *Pteridium aquilinum* subsp. *caffrum* occurs over much of the grassland, never very common, but always present.

Abiotic environment and climate

Altitude range of 1300 to 1812 m asl with a mean of 1467 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 44.6% while the similarly measured clay content is 32%. Soil pH is 5.5.

Precipitation during driest quarter is 119 mm.



Species of Conservation Importance

Endemic Plant Species

Impatiens wuerstenii [E], *Laureola micrantha* [E], *Lysimachia gracilipes* [NE], *Streptocarpus brachynema* [E].

Threatened Plant Species

Aloe rhodesiana [VU*], *Streptocarpus brachynema* [EN].

Photographic credits Summit grasslands, Mt Gorongosa, Sofala Province. photos: *left*: M. Stalmans; *right*: M. Lotter.

RLE Assessment

Assessment Summary

This ecosystem has a highly restricted distribution with evidence of considerable degradation and future climate-driven reductions in extent. **Critically Endangered**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 20.27% decline since 1750, and this ecosystem is assessed as Least Concern under A3. However, future climate models predict declines in suitable climate of 67-81% between 2000 & 2050. As such this ecosystem is assessed as Critically Endangered under A2a, with plausible bounds of Endangered-Critically Endangered.

Criterion B: This ecosystem has an AOO of 3 10 x 10 km grid cells and an EOO of 119.28 km2. It has undergone substantial historical decline, and there is evidence that deforestation & other threats are leading to continuing decline. Critically Endangered.

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 77.44% of the current distribution faces >90 percent degradation severity, 97.35% of the distribution faces >70 percent degradation severity, and 97.35% of the distribution faces >50 percent degradation severity. Endangered

Criterion E: Not evaluated

MANICA MONTANE GRASSLAND

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Pradaria de montanha de Manica
Biome Savannas and grasslands (T4)
Functional group Temperate subhumid grasslands (T4.5)
Regional Ecosystem Eastern Highlands Grassland

Description

Grasslands on mountain summits and gentle to moderate slopes.

Distribution

Along the eastern highlands area above 1300 m, from above Rotanda in the south, northwards to Choa Mountain above Catandica; in Manica Province. Also occurring in Zimbabwe.

Characteristic native biota

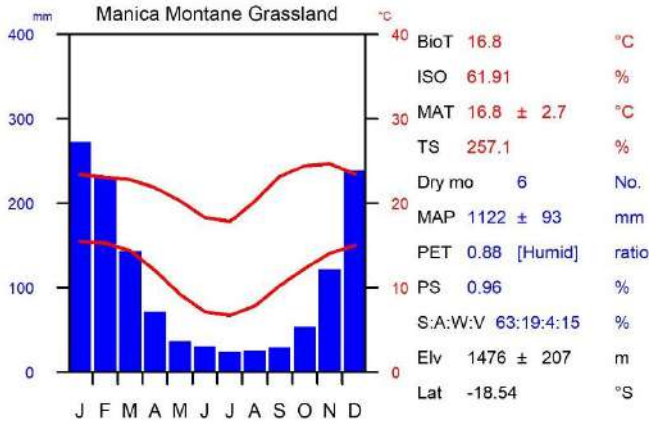
Woody species are sparse and are composed of *Cassinopsis tinifolia, Dissotis princeps, Erica hexandra*, *E. mannii, E. simii, Euphorbia citrina, Kotschya strigosa, K. thymodora* subsp. *thymodora, Gerrardina eylesiana, Heteromorpha montana, Maesa lanceolata, Mussaenda arcuata, Phyllanthus hutchinsonianus, Protea caffra* subsp. *gazensis, Psorospermum febrifugum,* and *Solanum aculeastrum* var. *aculeastrum.* The grassland tree fern, *Cyathea dregei* is often prominent.

Herbaceous layer is comprised of *Aeschynomene rhodesiaca, Aloe inyangensis* var. *inyangensis, A. myriacantha, Crotalaria collina, Exacum zombense, Crotalaria gazensis, C. variegata, Loudetia simplex, Pachycarpus chirindensis, Pearsonia sessilifolia, Rhynchosia monophylla, R. swynnertonii, Sphenostylis erecta* subsp. *obtusifolia,* and *Tephrosia dasyphylla.*

Abiotic environment and climate

Altitude range of 1300 to 2148 m asl with a mean of 1476 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 46.0% while the similarly measured clay content is 34.1%. Soil pH is 5.6.

Precipitation during driest quarter is 65.3 mm.



Species of Conservation Importance

Endemic Plant Species

There are 21 montane grassland and rock outcrop strict endemics to the Zimbabwe/Mozambique border grasslands from Rukotso to Cashel, including Choa and Gorongosa mountains. Plus an additional 6 grassland/montane bushland/bare rock taxa endemic to Tsetserra Mountain. The following 16 species are endemic to this vegetation type:

Afrosciadium rhodesicum [NE*], *Aloe cannellii* [E], *Aloe inyangensis* var. *kimberleyana* [NE], *Crotalaria insignis* [NE*], *Dierama inyangense* [NE*], *Digitaria fuscopilosa* [E], *Disa zimbabweensis* [NE*], *Euphorbia depauperata* var. *tsetserrensis* [NE], *Geranium exellii* [NE*], *Helichrysum acervatum* [NE], *Helichrysum chasei* [NE], *Indigofera vicioides* subsp. *excelsa* [NE], *Phyllanthus manicaensis* [E*], *Phyllanthus tsetserrae* [E*], *Pterocephalus centennii* [E*], *Tulbaghia friesii* [NE].

Threatened Plant Species

Afrosciadium rhodesicum [VU*], *Crotalaria insignis* [VU*], *Dierama inyangense* [EN*], *Disa zimbabweensis* [VU*], *Geranium exellii* [EN*], *Phyllanthus manicaensis* [VU*], *Phyllanthus tsetserrae* [CR*], *Pterocephalus centennii* [CR*].

Photographic credits *Top left*: summit of Choa Mt, Catandica District. photo: M. Lotter; *top right*: summit of Choa Mt, Catandica District. photo. J. Burrows; *bottom*: lower grasslands, Tsetserra. photo: M. Lotter.

RLE Assessment

Assessment Summary

This ecosystem has a restricted geographic distribution, but there is little evidence of ongoing declines in extent. However, there is evidence that climate change will greatly reduce climatically suitable area in the future. **Endangered**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 25.02 % decline since 1750. and this ecosystem is assessed as Least Concern under A3. However, future climate models predict declines in suitable climate of 60-85% between 2000 & 2050. As such this ecosystem is assessed as Endangered under A2a, with plausible bounds of Endangered-Critically Endangered.

Criterion B: This ecosystem has an AOO of 30 10 x 10 km grid cells and an EOO of 6713.54 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.05% of the current distribution faces >90 percent degradation severity, 1.34% of the distribution faces >70 percent degradation severity, and 27.45% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

CHITONGA MONTANE WOODED GRASSLAND

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Pradaria arbórea de montanha de Chitonga

Biome Savannas and grasslands (T4)

Functional group Temperate subhumid grasslands (T4.5)

Regional Ecosystem Northern Highlands Grassland

Description

Short montane grassland on slopes of the Lupilichi Mountains. At elevations above 1375, the Lupilichi Escarpment Miombo opens up to form a wooded grassland (Chitonga Montane Wooded Grassland, this unit). Soils with metal-rich soils occur in this unit.

Distribution

Lupilichi Mountains in Niassa Province, extending into Tanzania.

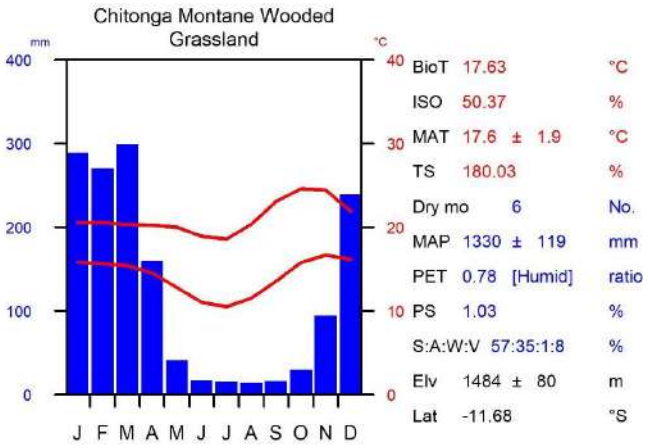
Characteristic native biota

Above 1375 m the miombo woodland opens up and woody species include *Uapaca kirkiana, Faurea rochetiana, Protea madiensis* subsp. *madiensis, P. micans* subsp. *trichophylla, P. rupestris, Erica mannii* subsp. *pallidiflora, Erica woodii, Psorospermum febrifugum* and *Morella pilulifera*, mostly to less than 3 m tall. Along the mountain ridge the low shrubs *Kotschya strigosa* and *Cryptosepalum maraviense* are common. The montane grassland is mostly short, to c. 50 cm in height and rich in dwarf shrubs, herbs and geophytes. *Hartsiella sp. nov.* (aff. to *H. bampsii* which is indicative of metal-rich soils).

Abiotic environment and climate

Altitude range of 1350 to 1701 m asl with a mean of 1484 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 44.6% while the similarly measured clay content is 36.1%. Soil pH is 5.6.

Precipitation during driest quarter is 11.9 mm.



Species of Conservation Importance: none recorded.

Photographic credits Montane grassland, Mt Chitonga, Lago District, Niassa Province. photos: *left*: J. Osborne; *right*: C. Datizua.

RLE Assessment

Assessment Summary

This ecosystem has undergone substantial historical decline, and there is evidence that deforestation & other threats are leading to continuing decline. There is also evidence that climate change will greatly reduce climatically suitable area in the future. **Critically Endangered**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 34.21% decline since 1750. and this ecosystem is assessed as Least Concern under A3. However, future climate models predict declines in suitable climate of 92-99% between 2000 & 2050. As such this ecosystem is assessed as Critically Endangered under A2a.

Criterion B: This ecosystem has an AOO of 7 10 x 10 km grid cells and an EOO of 376.62 km2. It has undergone substantial historical decline, and there is evidence that deforestation & other threats are leading to continuing decline. Critically Endangered

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.46% of the current distribution faces >90 percent degradation severity, 16.93% of the distribution faces >70 percent degradation severity, and 96.57% of the distribution faces >50 percent degradation severity. Vulnerable

Criterion E: Not evaluated

LICHINGA WOODED GRASSLAND

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Pradaria arbórea de Lichinga

Biome Savannas and grasslands (T4)

Functional group Temperate subhumid grasslands (T4.5)

Regional Ecosystem Northern Highlands Grassland

Description

Tall montane grassland.

Distribution

Areas above 1500 m on the Lichinga Plateau of Niassa Province.

Characteristic native biota

Rich in tall herb species, especially in the families Fabaceae, Asteraceae and Lamiaceae, and the genera *Vernonia, Leonotis, Desmodium, Polygala*, with several dominant grasses including *Andropogon schirensis, Arthraxon hispidus, Chloris pycnothrix, Chrysopogon fulvus, Cynodon plectostachyus, Exotheca abyssinica, Hyparrhenia cymbaria, H. dichroa, Loudetia simplex, Microchloa caffra, Stereochlaena cameronii*, and *Themeda triandra*.

Several small herbs and woody forbs include *Acalypha psilostachya* var. *psilostachya, Aeollanthus serpiculoides, Delphinium dasycaulon, Habenaria pubipetala, Hylodesmum repandum, Lablab purpureus* subsp. *purpureus, Sida rhombifolia, Swertia* sp., *Tephrosia nyikensis, Thalictrum rhynchocarpum*, and *Wahlenbergia* sp.

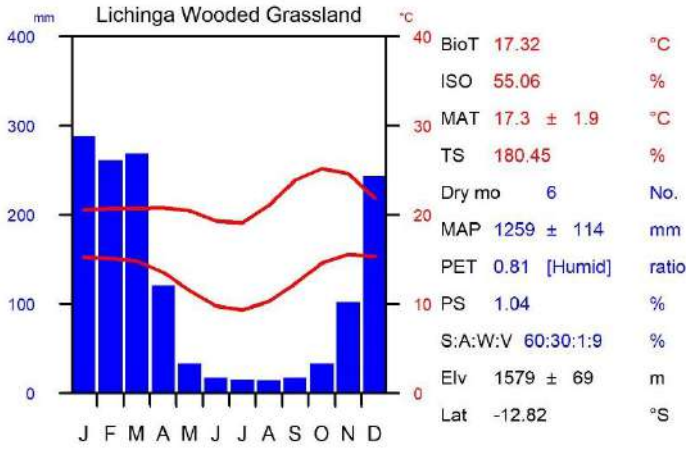
Shrubby or climbing species include *Clematis simensis, Pseudarthria hookeri, Rhoicissus tridentata, Sparrmannia ricinocarpa*, and *Tecomaria nyassae.*

Woody species are scattered throughout the savanna including tree species *Acacia abyssinica, A. amythethophylla, Cussonia arborea, Dombeya rotundifolia, Faurea rochetiana, Parinari curatellifolia, Protea madiensis* subsp. *madiensis,* and *Steganotaenia araliacea.*

Abiotic environment and climate

Altitude range of 1480 to 1785 m asl with a mean of 1579 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 50.7% while the similarly measured clay content is 33.1%. Soil pH is 5.6.

Precipitation during driest quarter is 10.8 mm.



Species of Conservation Importance: none recorded.

Photographic credits Njesi Plateau, Lichinga District, Niassa Province. photo. J. Osborne.

RLE Assessment

Assessment Summary

This ecosystem has a restricted geographic distribution but there is little evidence of ongoing declines in extent. However, moderate degradation levels are present across most of the distribution of the ecosystem. **Vulnerable**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 20.56% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 11 10 x 10 km grid cells and an EOO of 1732.4 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 1.15% of the current distribution faces >90 percent degradation severity, 9.47% of the distribution faces >70 percent degradation severity, and 96.59% of the distribution faces >50 percent degradation severity. Vulnerable

Criterion E: Not evaluated

MECULA SUMMIT GRASSLAND

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Pradaria do Cume de Mecula
Biome Savannas and grasslands (T4)
Functional group Temperate subhumid grasslands (T4.5)
Regional Ecosystem Northern Highlands Grassland

Description

Montane grassland on the summit of Mecula Mountain with gentle to steeply undulating slopes, occurring on deep soils or rocky areas.

Distribution

Summit of Mecula Mountain in Niassa Province.

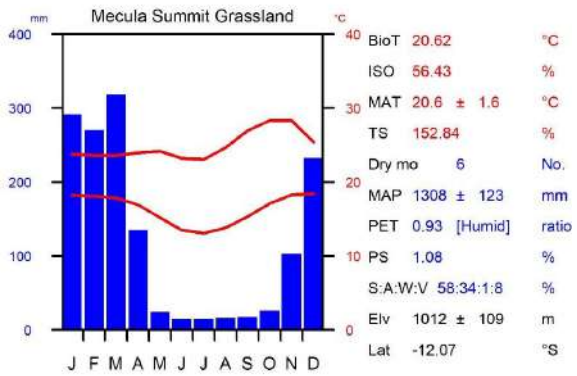
Characteristic native biota

This unit is poorly surveyed and very little is known about the floristic diversity of these grasslands. Climatically, they differ significantly from the other Mozambique grasslands and the species composition is expected to be different. Fire may play a more important role than climate in maintaining the grassland structure. These may also be secondary grasslands and more research is required.

Abiotic environment and climate

Altitude range of 950 to 1290 m asl with a mean of 1012 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 48.3% while the similarly measured clay content is 33.4%. Soil pH is 5.5.

Precipitation during driest quarter is 10 mm.



Species of Conservation Importance: none recorded.

Photographic credits Mecula Plateau looking south, Niassa Province. photo: J. Timberlake.

RLE Assessment

Assessment Summary

This ecosystem has a restricted geographic distribution but there is little evidence of ongoing declines in extent. However, moderate degradation levels are present across most of the distribution of the ecosystem. **Vulnerable**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 2.21% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 4 10 x 10 km grid cells and an EOO of 55.42 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0% of the current distribution faces >90 percent degradation severity, 1.73% of the distribution faces >70 percent degradation severity, and 93.28% of the distribution faces >50 percent degradation severity. Vulnerable

Criterion E: Not evaluated

NAMULI MONTANE GRASSLAND

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Pradaria de Montanha do Namuli
Biome Savannas and grasslands (T4)
Functional group Temperate subhumid grasslands (T4.5)
Regional Ecosystem Northern Highlands Grassland

Description

Short montane grasslands found on the more level plateau areas but also on moderate to steep slopes, also in rocky areas and on shallow soils overlying sheet rock.

Distribution

Summit of Namuli Mountain (Zambezia Province).

Characteristic native biota

Much of the grassland on the Namuli massif is on waterlogged, acidic, deep peat deposits. Grasses are tussocky, primarily *Loudetia simplex*, but with *Themeda triandra* and *Eragrostis* species more common on better-drained sites. Other grasses recorded include *Allochaete namuliensis, Andropogon schirensis, Cenchrus unisetum, Digitaria appropinquata, Eriochrysis pallida, Melinis repens,* and *Setaria sphacelata*.

The non-grass flora of shrublets, forbs and geophytes is rich, a few of which includes *Aeschynomene nodulosa, Afrosciadium nyassicum, Alepidea peduncularis, Antherotoma naudinii, Argyrolobium rupestre* subsp. *aberdaricum, Buchnera lastii, Cephalaria alpina, Commelina africana, Crassocephalum rubens, Crotalaria namuliensis, C. torrei, Cyphia lasiandra, Euphorbia depauperata, Exacum zombensis, Gladiolus crassifolius, G. zimbabweensis, Gnidia involucrata, Haumaniastrum villosum, Helichrysum lastii, H. sulphureo-fuscum, Hypoxis nyasica, Indigofera lyallii* subsp. *nyassica, Kniphofia splendida, Micromeria imbricata, Moraea schimperi, Ocimum obovatum, Pimpinella mulanjensis, Rhynchosia torrei, Senecio auriculatissimus, S. oxyriifolius, S. peltophorus, Sopubia ramosa, Stachys didymantha, Striga angustifolia, Thunbergia petersiana, Valeriana capensis,* and the orchids *Disa welwitschii, Eulophia milnei, E. speciosa* and *Satyrium neglectum.*

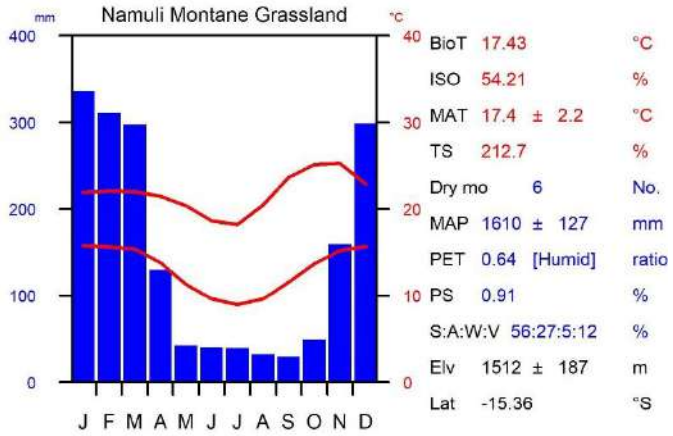
Tree ferns (*Cyathea dregei*) are found scattered along drainage lines and the bracken fern *Pteridium aquilinum* subsp. *caffrum* may form dense stands in places.

The numerous granite outcrops support a distinct flora (also included under Northern Inselberg Woodland), with a few of the species recorded being *Aeollanthus buchnerianus, Aloe mawii, Cheilanthes leachii, Crassula globularioides, C. sarcocaulis, C. zombensis, Dissotis johnstoniana, Kalanchoe elizae, Merwilla lazulina, Tetradenia riparia, Xerophyta kirkii* and *X. splendens*.

Abiotic environment and climate

Altitude range of 1400 to 2005 m asl with a mean of 1512 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 52.1% while the similarly measured clay content is 28.6%. Soil pH is 5.5.

Precipitation during driest quarter is 65.4 mm.



Species of Conservation Importance

Endemic Plant Species

Fifteen taxa are strictly endemic to Mt Namuli grassland-montane shrubland-bare rock: *Alloeochete namuliensis, Aloe torrei, Buchnera namuliensis, Ceropegia nutans, Coleus namuliensis, Crotalaria namuliensis, Crotalaria torrei, Cyanotis namuliensis, Digitaria appropinquata, Euphorbia namuliensis, Indigofera namuliensis, Inversodicraea torrei *, Kyllinga* sp. nr. *K. nervosa* of FZ, *Rhynchosia clivorum* subsp. *gurueensis,* and *Rhynchosia torrei*. Many others are near-endemic, i.e. also on Mt Mulanje in Malawi.

Threatened Plant Species

Inversodicraea torrei [VU*].

Photographic credits *Left & right*: grasslands on summit of Namuli Mt., Zambezia Province. photos: J. Timberlake.

RLE Assessment

Assessment Summary	Assessment Information
This ecosystem has seen substantial historical declines, losing over 71% of its original distribution. **Endangered**	**Criterion A:** Expansion of urban areas, agriculture & deforestation has caused a 71.08% decline since 1750. Endangered **Criterion B:** This ecosystem has an AOO of 4 10 x 10 km grid cells and an EOO of 425.27 km2. While it has a restricted distribution and has undergone substantial historical decline, evidence that deforestation & other threats are leading to continuing decline is lacking. Least Concern **Criterion C:** Not evaluated **Criterion D:** Degradation assessment shows that 2.63% of the current distribution faces >90 percent degradation severity, 31.51% of the distribution faces >70 percent degradation severity, and 96.44% of the distribution faces >50 percent degradation severity. Vulnerable **Criterion E:** Not evaluated

ULONGUE PLATEAU GRASSLAND

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Pradaria do planalto de Ulongué

Biome Savannas and grasslands (T4)

Functional group Temperate sub-humid grasslands (T4.5)

Regional Ecosystem Northern Highlands Grassland

Description

Grasslands and wooded grasslands above 1300 m.

Distribution

On Ulongue Plateau, in Tete Province, bordering on Malawi.

Characteristic native biota

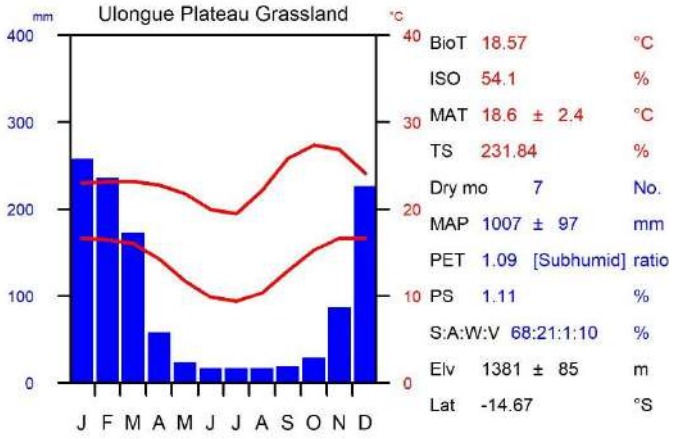
Grasslands and wooded grasslands with scattered *Acacia abyssinica, A. karroo, Morella pilulifera*, and patches of high-rainfall miombo composed of *Brachystegia spiciformis* and *B. boehmii*, as well as *Albizia antunesiana, Combretum molle, Coptosperma neurophylla, Croton macrostachyus, Cussonia arborea, Dombeya burgessiae, Embelia schimperi, Faurea rochetiana, Parinari curatellifolia,* and *Uapaca kirkiana.* At lower altitudes and lower rainfall occur *Azanza garckeana, Dombeya rotundifolia, Mundulea sericea, Pappea capensis, Peltophorum africanum,* and *Philenoptera violacea*.

Grasses recorded are *Brachiaria brizantha, Chloris pycnothrix, C. virgata, Cleistachne sorghoides, Coelorachis* sp., *Eragrostis welwitschii, Hyparrhenia dissoluta, H. filipendula, H. rufa, Imperata cylindrica, Melinis repens, Panicum maximum, Paspalum commersonii, Pennisetum polystachyon, Setaria verticillata, Sporobolus pyramidalis,* and *Stereochlaena cameronii*, giving way at higher altitudes to *Eragrostis* spp., *Exotheca abyssinica, Digitaria diagonalis, Setaria orthosticha,* and *Themeda triandra.*

Abiotic environment and climate

Altitude range of 1210 to 1600 m asl with a mean of 1380 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 63.9% while the similarly measured clay content is 21.6%. Soil pH is 6.0.

Precipitation during driest quarter is 11.3 mm.



Species of Conservation Importance: none recorded.

RLE Assessment

Assessment Summary

This ecosystem has a highly restricted distribution, with large historical declines and evidence of continuing recent declines. **Critically Endangered**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 94.32% decline since 1750. Critically Endangered

Criterion B: This ecosystem has an AOO of 14 10 x 10 km grid cells and an EOO of 1513.98 km2.While it has restricted distribution, evidence that deforestation & other threats are leading to continuing decline is lacking. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 20.68% of the current distribution faces >90 percent degradation severity, 50.94% of the distribution faces >70 percent degradation severity, and 95.95% of the distribution faces >50 percent degradation severity. Vulnerable

Criterion E: Not evaluated

3.1.2 Realm Freshwater-Terrestrial

3.1.2.1 Biome: TF1 Palustrine wetlands

TF1.1 Tropical flooded forests and peat forests

SUBTROPICAL SWAMP FOREST

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Floresta pantanosa subtropical
Biome Palustrine wetlands (TF1)
Functional group Tropical flooded forests and peat forests (TF1.1)
Regional Ecosystem Swamp Forest

Description

Evergreen forest in pockets or narrow strips in areas that are permanently or seasonally inundated with water. The vegetation is adapted to being submerged and starved of oxygen for several months and a number of species have developed stilt roots or pneumatophores to improve aeration. This community is more frequent at low altitudes, but variants may also occur at higher altitudes.

Distribution

From Bilene in Gaza Province, extending southwards through Maputo Province and into South Africa.

Characteristic native biota

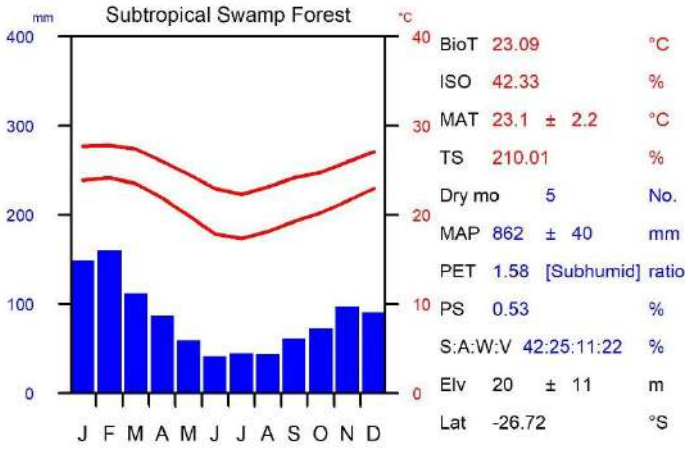
From south of Bilene the following swamp forest species are typical: *Barringtonia racemosa, Bridelia micrantha, Ficus trichopoda, F. verruculosa, Hibiscus tiliaceus, Macaranga capensis, Morella serrata, Phoenix reclinata, Raphia australis, Rauvolfia caffra, Syzygium cordatum, Tarenna pavettoides* subsp. *pavettoides*, and *Voacanga thouarsii.*

Important and diagnostic fern species include *Acrostichum aureum, Stenochlaena tenuifolia, Lindsaea ensifolia, Lygodium microphyllum, Cyclosorus interruptus, Thelypteris confluens* and *Nephrolepis biserrata* which are all characteristic of freshwater or brackwater swamp forest. Other species occurring include *Asparagus setaceus, Embelia xylocarpa*, *Gloriosa superba,* and *Mikania natalensis.*

Abiotic environment and climate

Altitude range of 7 to 50 m asl with a mean of 20 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 67.9% while the similarly measured clay content is 19.2%. Soil pH is 5.5.

Precipitation during driest quarter is 107.1 mm.



Species of Conservation Importance: none recorded.

Photographic credits *left*: swamp forest dominated by *Ficus trichopda*, Maputo Special Reserve. photo: M. Stalmans; *right*: swamp forest with the diagnostic climbing fern, *Stenochlaena tenuifolia*, Ponta Techobanine photo. M. Lotter.

RLE Assessment

Assessment Summary

This ecosystem has a restricted geographic distribution but there is little evidence of ongoing declines in extent. However, moderate degradation levels are present across most of the distribution of the ecosystem. **Vulnerable**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 2.76% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 4 10 x 10 km grid cells and an EOO of 929.48 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 3.59% of the current distribution faces >90 percent degradation severity, 29.9% of the distribution faces >70 percent degradation severity, and 89.7% of the distribution faces >50 percent degradation severity. Vulnerable

Criterion E: Not evaluated

TROPICAL SWAMP FOREST

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Floresta pantanosa Tropical
Biome Palustrine wetlands (TF1)
Functional group Tropical flooded forests and peat forests (TF1.1)
Regional Ecosystem Swamp Forest

Description

Evergreen forest in pockets or narrow strips in areas that are permanently or seasonally inundated with water. The vegetation is adapted to being submerged and starved of oxygen for several months and a number of species have developed stilt roots or pneumatophores to improve aeration. This community is more frequent at low altitudes but variants may also occur at higher altitudes.

Distribution

From Bilene in Gaza Province in the south, northwards through Mozambique. Occurring in most Provinces.

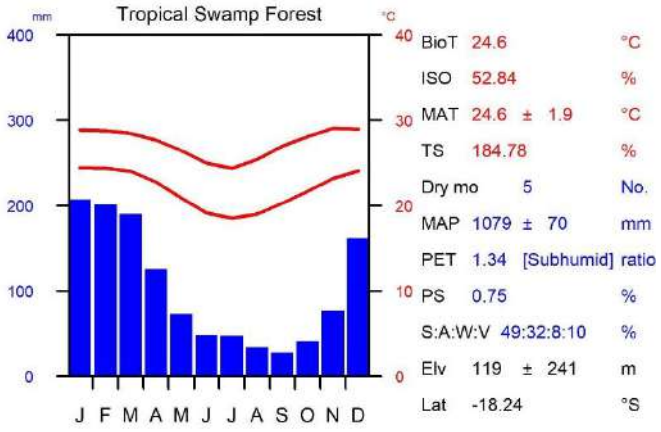
Characteristic native biota

Sometimes at higher altitudes the following may be present in swampy areas: *Albizia adianthifolia, A. glaberrima* var. *glabrescens, Antidesma vogelianum, Anthocleista grandiflora, Barringtonia racemosa, Breonadia salicina, Bridelia micrantha, Faurea delevoyi, Ficus trichopoda, F. verruculosa, Gardenia imperialis* subsp. *imperialis, Hibiscus tiliaceus, Maesa angolensis, Pandanus livingstonianus, Parkia filicoidea, Raphia farinifera, Synsepalum brevipes, Syzygium cordatum, S. owariense, Uapaca lissopyrena, Voacanga thouarsii* (occurring up to 700 m), *Xylopia rubescens* var. *rubescens*, and the climbers *Entada rheedii* and *Derris trifoliata.* The shrubs *Aeschynomene heurckeana, Ludwigia leptocarpa, Psydrax kraussioides* and *Tarenna pavettoides* subsp. *gillmanii* may be present, with the characteristic climbing swamp fern, *Stenochlaena tenuifolia*, and other ferns (*Blotiella natalensis, Cyclosorus interruptus, Thelypteris confluens*) often occurring in the understorey of, or in association with, swamp forest.

Abiotic environment and climate

Altitude range of 6 to 801 m asl with a mean of 119 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 56.2% while the similarly measured clay content is 26.2%. Soil pH is 5.6.

Precipitation during driest quarter is 37.1 mm.



Species of Conservation Importance: none recorded.

Photographic credits *left*: swamp forest with *Pandanus livingstonianus* and abundant ferns, Bilene, Gaza Province. photo: J. Burrows; *right*: Mueda plateau, Cabo Delgado Province. Photo. M. Lotter.

RLE Assessment

Assessment Summary

This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 22.24% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 0 10 x 10 km grid cells and an EOO of 138429.77 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Not evaluated

Criterion E: Not evaluated

TF1.4 Seasonal floodplain marshes

ZAMBEZIAN PAPYRUS WETLAND

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Terras húmidas de papiro do Zambeze
Biome Palustrine wetlands (TF1)
Functional group Seasonal floodplain marshes (TF1.4)
Regional Ecosystem Tropical Wetland Vegetation

Description

Papyrus wetlands occur in deep, permanently inundated areas. This unit is often referred to as "Sudd", which specifically refers to any large solid floating vegetation island or mat.

Distribution

Permanently inundated wetland areas at low altitudes. Scattered throughout Mozambique but only the larger patches have been mapped and it is more widespread than that mapped. Currently recorded in Niassa, Sofala and Zambezia Provinces.

Characteristic native biota

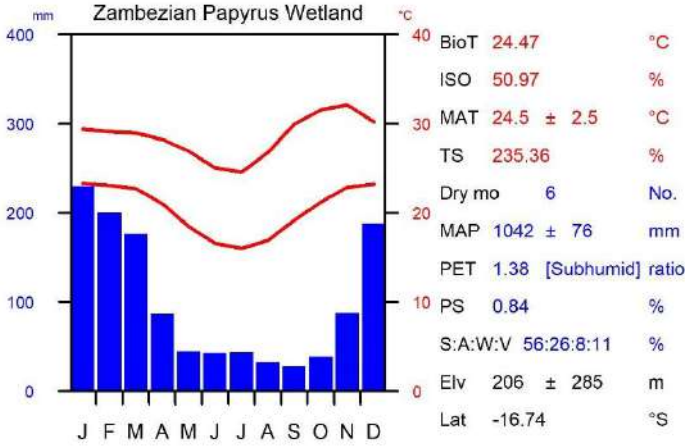
Composed predominantly of *Cyperus papyrus*, with other *Cyperus* spp. and *Phragmites* reed beds. *Vossia cuspidata* and *Echinochloa pyramidalis* form floating mats on open water, with *Pennisetum purpureum* and *Phragmites mauritianus* more frequent at the edges of rivers and swamps.

Other typical species include: *Azolla pinnata, Ipomoea aquatica, Ludwigia stolonifera, L. erecta, L. leptocarpa, L. octovalvis, Nymphaea nouchali* var. *caerulea, Nymphoides indica, Polygonum salicifolium, P. pulchrum, Pycreus nitidus*, *Trapa natans* and *Wolffiella denticulata.*

Abiotic environment and climate

Altitude range of 5 to 650 m asl with a mean of 207 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 45.5% while the similarly measured clay content is 34.9%. Soil pH is 6.2.

Precipitation during driest quarter is 39.8 mm.



Species of Conservation Importance

Endemic Plant Species

Ammannia ramosissima [E].

Photographic credits Papyrus swamp, Gorongosa National Park: photo: M. Stalmans.

RLE Assessment

Assessment Summary

This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 12.63% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 62 10 x 10 km grid cells and an EOO of 40413.37 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.16% of the current distribution faces >90 percent degradation severity, 3.14% of the distribution faces >70 percent degradation severity, and 21.85% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

3.1.3 Realm Freshwater

3.1.3.1 Biome: F2 Lakes

F2.2 Small permanent freshwater lakes

FRESHWATER LAKE

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Lago de água doce
Biome Lakes (F2)
Functional group Small permanent freshwater lakes (F2.2)
Regional Ecosystem Freshwater Lakes

Description

Permanent freshwater water bodies of various depths.

Distribution

Scattered throughout Mozambique, with a higher density in southern Mozambique near the coast.

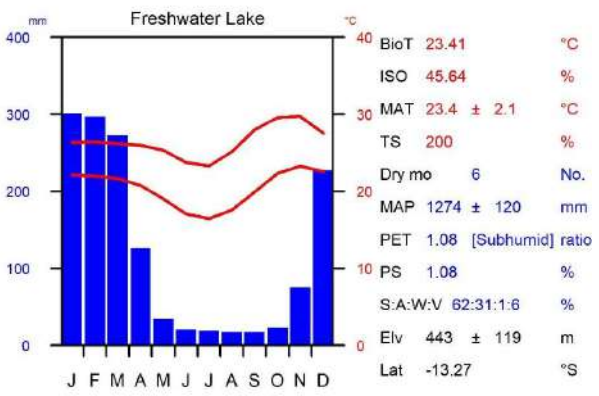
Characteristic native biota

Waterbodies without vegetation other than floating or submerged plants. Not covered in detail here.

Abiotic environment and climate

Altitude range of 6 to 476 m asl with a mean of 432 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 52.5% while the similarly measured clay content is 27.9%. Soil pH is 5.9.

Precipitation during driest quarter is 14.8 mm.



Species of Conservation Importance: none recorded.

Photographic credits Maputo Special Reserve. photo. M. Lotter.

RLE Assessment	
Assessment Summary	**Assessment Information**
Not assessed	**Criterion A:** Not evaluated **Criterion B:** Not evaluated **Criterion C:** Not evaluated **Criterion D:** Not evaluated **Criterion E:** Not evaluated

F2.7 Ephemeral salt lakes

BANHINE INLAND SALT PANS

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Depressão salgada do interior de Banhine

Biome Lakes (F2)

Functional group Ephemeral salt lakes (F2.7)

Regional Ecosystem Savanna-Highveld Salt Pan Halophytics

Description

Halophytic shrub savanna or grassland with mostly herbaceous vegetation. The xerophytic character increases with salinity and reduced rainfall and increased temperatures.

Distribution

Mucuvane to Banhine in Mozambique, in Gaza and Inhambane Provinces.

Characteristic native biota

This vegetation type is primarily a grassland or wooded grassland, much of it seasonally wet or inundated. Major grasses are *Acroceras macrum, Aristida stipitata, Cynodon dactylon* (often dominant), *Eriochloa meyeriana, Setaria incrassata, Digitaria eriantha, Echinochloa colona, Eragrostis gummiflua, E. pallens, E.* sp. cf. *heteromera, Heteropogon contortus, Panicum maximum, Paspalidium obtusifolium, Sporobolus virginicus* and *Sporobolus consimilis.*

Woody communities, where present, are represented by *Acacia welwitschii* subsp. *delagoensis, Boscia albitrunca, Colophospermum mopane, Combretum apiculatum, Dalbergia melanoxylon, Dichrostachys cinerea, Drypetes mossambicensis, Guibourtia conjugata, Manilkara mochisia, Sclerocarya birrea* subsp. *caffra, Strychnos madagascariensis, Spirostachys africana, Terminalia sericea* and *Xeroderris stuhlmannii*. Moister soils support *Acacia borleae, A. xanthophloea, Combretum imberbe,* and *Salvadora persica*.

Soft shrubs and low herbaceous species on seasonally inundated flats or wet areas fringing pans include *Basilicum polystachyon, Euploca strigosa, Halosarcia indica, Harpagophytum procumbens, Nothosaerva brachiata, Oldenlandia corymbosa, Salicornia polystachya, Selago paniculata, Sesbania rostrata,* and *Sida rhombifolia,*

Grasses associated with the woody communities are *Aristida adscensionis, Digitaria eriantha, Heteropogon contortus, Schmidtia pappophoroides, Panicum maximum* and *Urochloa mossambicensis.*

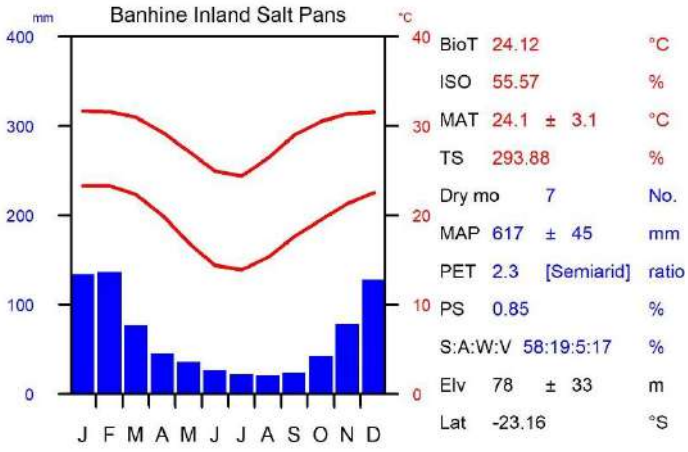
The pans and wetlands are fringed with *Aeschynomene pfundii, Bacopa floribunda, Eleocharis atropurpurea, Phragmites australis, P. mauritiana, Schoenoplectus lateriflorus, Schoenoplectiella senegalensis,* and *Typha capensis,* with open water supporting aquatics such as *Naja* spp., *Nymphaea nouchali, Nymphoides thunbergiana, N. indica* subsp. *occidentalis* and *Utricularia inflexa*.

In the southern end of this type it grades into an open woodland with some *Brachystegia spiciformis* and *Cassia abbreviata* var. *beareana.* In moderately salty areas, *Ischaemum arcuatum* and *Setaria holstii* with scattered *Acacia nilotica* subsp. *kraussiana*. With increasing salinity trees are absent and/or with scattered dwarf shrubs. The grasses then include *Eriochloa meyeriana, Sporobolus nitens* and *Aristida adscensionis* which form rhizomatous discontinuous patches with extensive bare areas in between. Other associated species include *Acacia borleae, Manilkara mochisia, Aeschynomene pfundii, Harpagophytum procumbens, Arthrocnemum* and *Salicornia, Atriplex, Suaeda*.

Abiotic environment and climate

Altitude range of 10 to 140 m asl with a mean of 78 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 61.0% while the similarly measured clay content is 23.7%. Soil pH is 6.5.

Precipitation during driest quarter is 29.1 mm.



Species of Conservation Importance

Endemic Plant Species

Hermannia torrei [E*].

Photographic credits *all photos*: Banhine National Park. photos: M. Stalmans

RLE Assessment

Assessment Summary

This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 11.62% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 138 10 x 10 km grid cells and an EOO of 38176.57 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.01% of the current distribution faces >90 percent degradation severity, 0.71% of the distribution faces >70 percent degradation severity, and 15.77% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

3.1.4 Realm Freshwater-Marine

3.1.4.1 Biome: FM1 Semi-confined transitional waters

FM 1.3 Intermittently closed and open lakes and lagoons

COASTAL LAGOONS

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Lagoas costeiras

Biome Semi-confined transitional waters (FM1)

Functional group FM 1.3 Intermittently closed and open lakes and lagoons (FM1.3)

Regional Ecosystem Coastal Lagoons

Description

Coastal Lagoons usually show a connection to the marine environment and are under tidal influence. In contrast to Freshwater Lakes, which were never connected to the ocean and are not influenced by the tides. Lagoons may be temporarily or permanently inundated.

Distribution

Along coastal areas; occurring in Gaza, Inhambane, and Maputo Provinces.

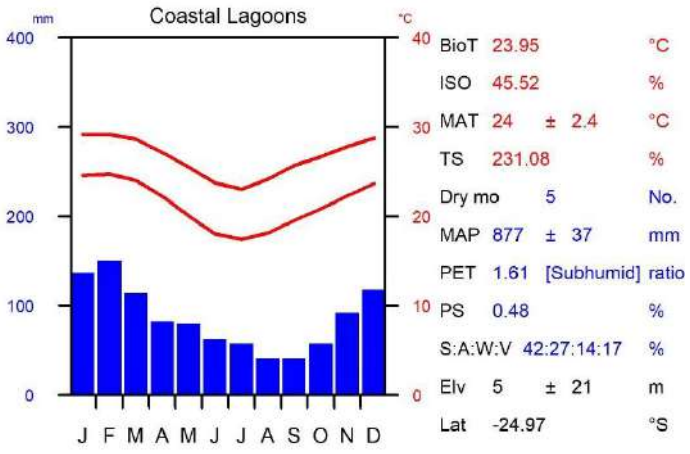
Characteristic native biota

Inundated and saline. Salt marshes may develop adjacent to temporary lagoons.

Abiotic environment and climate

Altitude range of 1 to 14 m asl with a mean of 5 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 49.9% while the similarly measured clay content is 30%. Soil pH is 5.9.

Precipitation during driest quarter is 109 mm.



Species of Conservation Importance: none recorded.

RLE Assessment	
Assessment Summary	**Assessment Information**
Not assessed	**Criterion A:** Not evaluated **Criterion B:** Not evaluated **Criterion C:** Not evaluated **Criterion D:** Not evaluated **Criterion E:** Not evaluated

3.1.5 Realm Marine-Terrestrial

3.1.5.1 Biome: MT2 Supralittoral coastal systems

MT2.1 Coastal shrublands and grasslands

ROVUMA CORAL RAG THICKET

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Brenha sob destroços de coral do Rovuma
Biome Supralittoral coastal systems (MT2)
Functional group Coastal shrublands and grasslands (MT2.1)
Regional Ecosystem African Coral Rag Thicket

Description

Short and dense ticket 2–7 m tall, occurring on coral 'rag'. On Vamizi Island this thicket develops into a forest. Although the stratification is indistinct, it is present, with a definable shrub or small tree layer, and occasional trees emerging to 15 m, above the canopy of 10-12 m in height. It is a forest and therefore we have termed the Vamizi forest as 'dwarf coral rag forest'. This formation has not been detected on the adjacent mainland.

Distribution

Sporadically from Nacala northwards to the Rovuma River and along the Quirimba Islands (when not forested). Occurring in Cabo Delgado and Nampula Provinces.

Characteristic native biota

Coral Rag Thicket

A short thicket ± confined to mainland coral rag composed of shrubs and trees dwarfed by the rocky substrate and thin sandy soils. The more common trees and shrubs typically include *Acacia ataxacantha, Cassipourea mossambicensis, Clerodendrum glabrum, Coptosperma littorale, Dichrostachys cinerea* subsp. *forbesii, Diospyros bussei, D. consolatae, Dombeya acutangula, Erythroxylum polycladum, Euclea divinorum, E. natalensis* subsp. *obovata, E. racemosa* subsp. *sinuata, Euphorbia angularis, E. tirucalli, Ficus ingens, Flacourtia indica, Grewia glandulosa, Harrisonia abyssinica, Hilsenbergia petiolaris, Mimusops obtusifolia, Mystroxylon aethiopicum* subsp. *aethiopicum, Olax dissitiflora, Paracephaelis tricantha, Pemphis acidula, Strychnos gerrardii, Triainolepis africana* subsp. *hildebrandtii* and *Vitellariopsis kirkii.*

Other tree and shrub species recorded from this vegetation association are *Afrocanthium vollesenii, Caesalpinia bonduc, Calophyllum inophyllum, Capparis cartilaginea, C. erythrocarpos, C. sepiaria* var. *stuhlmannii, Combretum lindense, Commiphora pteleifolia, C. glandulosa, C. africana* var. *rubrifolia, Erythrina variegata, Grewia* sp. A of Burrows *et al*. 2018, *Guettarda speciosa, Guilandina bonduc, Pavetta curalicola,*

Psydrax martinii, Pycnocoma littoralis, Sophora tomentosa, Suriana maritima, Thilachium africanum, Trichilia sp. A of Burrows *et al*., 2018, *Turraea nilotica*, and *Uvaria scheffleri.*

Herbaceous species recorded include *Canavalia rosea, Rhynchosia sublobata, Cleome stricta*, and *Asparagus humilis*, the latter which is found only on coral rag and thin sands over coral.

Dwarf Coral Rag Forest (Vamizi Island)

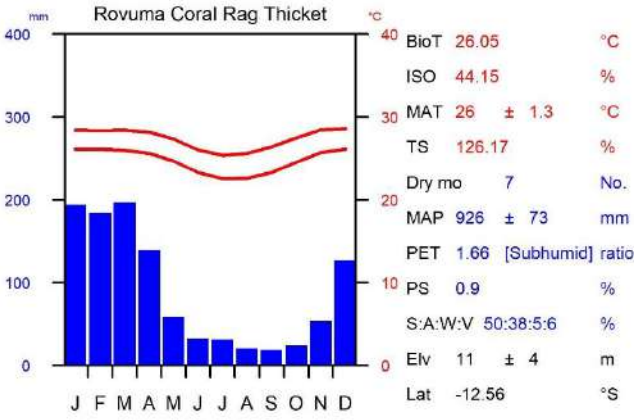
The main canopy species are *Acacia* cf. *quiterajoensis, A. robusta* var. *clavigera, Diospyros bussei, D. consolatae, Elaeodendron* sp. (cf. *E. schlechterianum), Erythroxylum platyclados, Euphorbia tirucalli, Mimusops obtusifolia, Pleurostylia* sp. nov. cf. *P. opposita, Sideroxylon inerme* subsp. *diospyroides, Terminalia boivinii* and *Xylocarpus moluccensis.*

The understorey is composed of *Coptosperma littorale, Euclea racemosa* subsp. *schimperi, Grewia glandulosa, Hilsenbergia petiolaris, Mallotus oppositifolius* var. *lindicus, Mystroxylon aethiopicum, Pavetta tendagurensis, Pemphis acidula, Polysphaeria multiflora* and *Suregada zanzibarensis*. The margins are occupied by, among others, *Clerodendrum glabrum, Commiphora zanzibarica, Dombeya acutangula, Grewia glandulosa, Senna petersiana, Trema orientalis* and *Triainolepis africana* subsp. *hildebrandtii.* The Endangered shrub *Barleria whytei* is recorded from this vegetation type.

Abiotic environment and climate

Altitude range of 2 to 20 m asl with a mean of 11 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 54.1% while the similarly measured clay content is 28.7%. Soil pH is 6.0.

Precipitation during driest quarter is 26.7 mm.



Species of Conservation Importance

Endemic Plant Species

Afrocanthium vollesenii [NE], *Barleria laceratiflora* [NE*], *Barleria setosa* [E]. *Euphorbia angularis* [E*], *Mallotus oppositifolius* var. *lindicus* [NE*], *Pavetta curalicola* (E).

Threatened Plant Species

Afrocanthium vollesenii [VU], *Barleria laceratiflora* [EN*], *Barleria setosa* [EN], *Barleria whytei* [EN*], *Diospyros bussei* [NT], *Erianthemum lindense* [VU], *Euphorbia angularis* [VU*], *Mallotus oppositifolius* var. *lindicus* [VU*], *Paracephaelis trichantha* subsp. *trichantha* [VU], *Pavetta curalicola* (NT).

Biogeographic Anomalies

Pycnocoma littoralis (confined to coral rag in Mozambique), *Xylocarpus moluccensis* (almost confined to coral rag in Mozambique), *Zanthoxylum lindense* (southern limit of the species).

Photographic credits *top left*: *Euphorbia angularis* in Coral Rag Thicket, Quissimajulo, Nacala. photo: M. Lotter; *top right*: Coral Rag Thicket with exposed coral, Quissimajulo. photo: M. Lotter; *below*: Dwarf Coral Rag Forest on Vamizi Island, Cabo Delgado. photo: J. Burrows.

RLE Assessment

Assessment Summary	Assessment Information
This ecosystem has a restricted geographic distribution but there is little evidence of ongoing declines in extent. However, moderate degradation levels are present across most of the distribution of the ecosystem. **Vulnerable**	**Criterion A:** Expansion of urban areas, agriculture & deforestation has caused a 15.58% decline since 1750. Least Concern **Criterion B:** This ecosystem has an AOO of 29 10 x 10 km grid cells and an EOO of 10060.25 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern **Criterion C:** Not evaluated **Criterion D:** Degradation assessment shows that 0.87% of the current distribution faces >90 percent degradation severity, 18.29% of the distribution faces >70 percent degradation severity, and 84.32% of the distribution faces >50 percent degradation severity. Vulnerable **Criterion E:** Not evaluated

SUBTROPICAL SEASHORE VEGETATION

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Vegetação da orla marítima subtropical
Biome Supralittoral coastal systems (MT2)
Functional group Coastal shrublands and grasslands (MT2.1)
Regional Ecosystem Seashore Vegetation

Description

Beach sand, usually between the spring tide line and the dune thicket, often forming the lower seaward ecotone to dune thicket.

Distribution

From Inhambane southwards to Ponta do Ouro. Occurring in Gaza, Inhambane and Maputo Provinces. Also in South Africa.

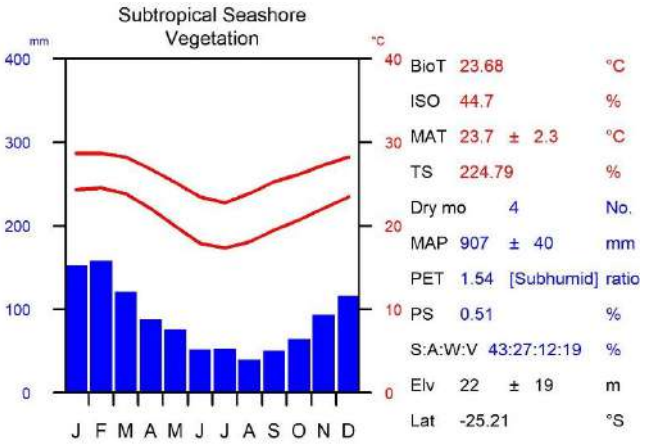
Characteristic native biota

Apart from the mostly planted or commonly naturalized *Casuarina equisetifolia*, tree and shrub species are few, mainly confined to *Guilandina bonduc, Sophora inhambanensis* and the endemic *Triainolepis sancta*. Shrubby or herbaceous dune stabilisers are mainly represented by *Arctotheca populifolia, Canavalia rosea, Carpobrotus dimidiatus, Cyperus crassipes, Ipomoea pes-caprae, Launaea sarmentosa, Phylohydrax carnosa, Scaevola plumieri, Sporobolus virginicus* and *Tephrosia purpurea* subsp. *dunensis.*

Abiotic environment and climate

Altitude range of 2 to 70 m asl with a mean of 22 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 62% while the similarly measured clay content is 21%. Soil pH is 6.1.

Precipitation during driest quarter is 101.1 mm.



Species of Conservation Importance

Endemic Plant Species

Solanum litoraneum [E].

Threatened Plant Species

Solanum litoraneum [EN].

Photographic credits *left*: *Sophora inhambanensis*, Ponta Techobanine, Maputo Province; *right*: *Scaevola plumieri* on the crest of a dune, Ponta Techobanine, Maputo Province. photos: M. Lotter

RLE Assessment

Assessment Summary

This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 28.91% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 20 10 x 10 km grid cells and an EOO of 27958.46 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Not evaluated

Criterion E: Not evaluated

TROPICAL SEASHORE VEGETATION

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Vegetação da orla marítima tropical
Biome Supralittoral coastal systems (MT2)
Functional group Coastal shrublands and grasslands (MT2.1)
Regional Ecosystem Seashore Vegetation

Description

Beach sand, usually between the spring tide line and the dune thicket, often forming the seaward face of the dune thicket.

Distribution

From Inhambane, northwards to the Rovuma River, Mozambique's northern border. Occurring in Cabo Delgado, Inhambane, Napula, Sofala, and Zambezia Provinces. Also into Tanzania.

Characteristic native biota

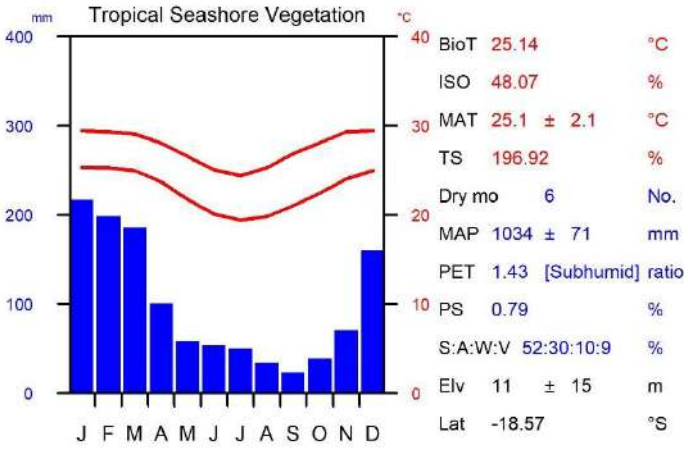
Small trees and shrubs are typically *Argusia argentea, Colubrina asiatica, Cordia subcordata, Guettarda speciosa, Guilandina bonduc, Lycium mascarenense, Pemphis acidula, Premna serratifolia, Scaevola sericea, Sophora tomentosa subsp. tomentosa, S. inhambanensis, Suriana maritima, Triainolepis sancta* (south of the Save R.), with occasional trees of *Calophyllum inophyllum, Erythrina fusca, E. variegata* and *Xylocarpus moluccensis* found on the Cabo Delgado shores. The coconut (*Cocos nucifera*) and *Casuarina equisetifolia* are both common and iconic of these northern beaches.

Herbaceous and graminoid species that are often dune colonizers include *Canavalia rosea, Caroxylon littorale, Carpobrotus dimidiatus, Cleome stricta, Crinum asiaticum, Cyperus crassipes, Halopyrum mucronatum, Ipomoea pes-caprae, Launaea sarmentosa, Scaevola plumieri, Sporobolus virginicus, Tephrosia purpurea subsp. dunensis*, and *Vigna marina*.

Abiotic environment and climate

Altitude range of 2 to 50 m asl with a mean of 11 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 58.3% while the similarly measured clay content is 23%. Soil pH is 6.3.

Precipitation during driest quarter is 49.4 mm.



Species of Conservation Importance

Endemic Plant Species

Blepharis dunensis [E].

Threatened Plant Species

Blepharis dunensis [EN].

Photographic credits *left & right*: Ilha de Benguerra, Inhambane Province. photos: M. Stalmans.

RLE Assessment

Assessment Summary

This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 32.04% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 47 10 x 10 km grid cells and an EOO of 333356.69 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Not evaluated

Criterion E: Not evaluated

MAPUTALAND DUNE FOREST

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Floresta das dunas de Maputaland
Biome Supralittoral coastal systems (MT2)
Functional group Coastal shrublands and grasslands (MT2.1)
Regional Ecosystem Subtropical Dune Forest

Description

Semi-deciduous to evergreen dune thicket. This unit represents some of the various successional communities within close proximity to the sea and may include sparsely vegetated dunes, short thicket-like dune vegetation, and young to maturing forest on dunes. The vegetation is usually thicket-like, with only a single stratum, but more typical forest develops in dune depressions or behind the foredune.

Distribution

From Xai Xai (Limpopo River mouth), southwards along the coast into South Africa. Occurring in Gaza and Maputo Provinces.

Characteristic native biota

The main tree and shrub species are *Acokanthera oblongifolia, Allophylus natalensis, Apodytes dimidiata, Brachylaena discolor, Brexia madagascariensis, Bridelia cathartica, Carissa bispinosa* var. *bispinosa, Catunaregam obovata, Clerodendrum glabrum, Commiphora schlechteri, Coptosperma littorale, Cordia caffra* var. *caffra, Craibia zimmermannii, Cussonia arenicola, Deinbollia oblongifolia, Diospyros rotundifolia, Dovyalis longispina, D. rhamnoides, Empogona coriacea, Euclea natalensis* subsp. *obovata, E. racemosa* subsp. *sinuata, Eugenia capensis* subsp. *capensis, Eugenia* sp. A of Burrows *et al.*(2018), *Ficus burtt-davyi, F. tremula, Grewia occidentalis* var. *litoralis, Guilandina bonduc, Gymnosporia arenicola, Maerua nervosa, Manilkara discolor, Margaritaria discoidea* var. *nitida, Mimusops caffra, Ochna natalitia, Osteospermum moniliferum* subsp. *rotundata, Osyris compressa, Pavetta gerstneri, P. revoluta, Psychotria amboniana* subsp. *mosambicensis, Psydrax moggii, P. obovata* subsp. *obovata, Searsia natalensis, Sideroxylon inerme, Tarenna junodii, Thespesia acutiloba, Triainolepis sancta, Tricalysia delagoensis, Vepris gerrardii, V. lanceolata*, and *Zanthoxylum delagoense*. The tree-like aloe, *Aloe marlothii*, often grows out above the seaward-side of the thicket, as does *Strelitzia nicolai* in the dune forest south of Maputo.

On the leeward side of the dunes will occur more well-developed specimens of those species found on the seaward slopes but now also including *Acacia kosiensis, A. kraussiana, Albizia adianthifolia, A. versicolor, Callichilia orientalis, Casearia gladiiformis, Celtis africana, Diospyros inhacaensis, Drypetes natalensis, Ficus natalensis, Monanthotaxis caffra, Pteleopsis myrtifolia, Strychnos gerrardii*, and *Ziziphus mucronata.*

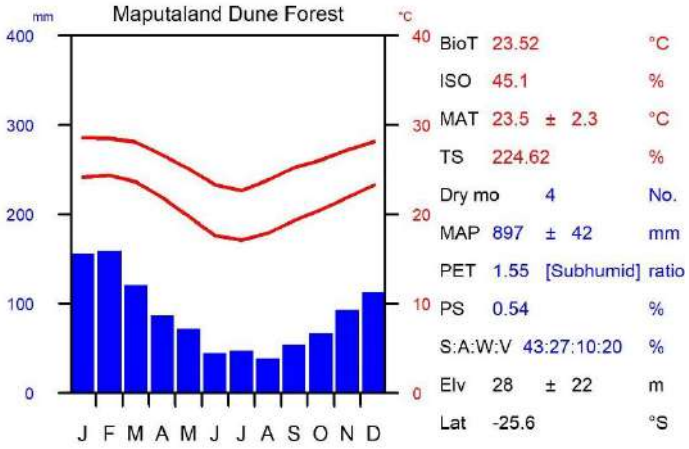
Climbers include *Adenia gummifera, Asparagus falcatus, A. setaceus, Capparis brassii, Cissampelos hirta, C. torulosa, Cynanchum ellipticum, Dalbergia obovata, Distephanus angulifolius, D. inhacensis, Grewia caffra, Rhoicissus digitata,* and *Scutia myrtina.*

Herbaceous species occupying the understorey are few but include *Asparagus densiflorus, Asystasia gangetica, Coleotrype natalensis, Ecbolium hastatum, Euphorbia baylissii, Isoglossa ciliata, Microsorum scolopendria, Plectranthus* spp., *Sansevieria hyacinthoides, Scadoxus puniceus, Viscum obovatum, Zamioculcas zamiifolia,* and the grass *Oplismenus hirtellus.*

Abiotic environment and climate

Altitude range of 6 to 85 m asl with a mean of 28 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 70.7% while the similarly measured clay content is 16.5%. Soil pH is 6.0.

Precipitation during driest quarter is 94.9 mm.



Species of Conservation Importance

Endemic Plant Species

Ecbolium hastatum [E], *Euphorbia baylissii* [E], *Psychotria amboniana* subsp. *mosambicensis* [E], *Solanum litoraneum* [E], *Tephrosia forbesii* subsp. *inhacensis* [E], *Triainolepis sancta* [E].

Threatened Plant Species

Ecbolium hastatum [EN], *Euphorbia baylissii* [VU], *Psychotria amboniana* subsp. *mosambicensis* [VU], *Solanum litoraneum* [EN], *Tephrosia forbesii* subsp. *inhacensis* [VU].

Biogeographic Anomalies

Encephalartos ferox, *Eugenia* sp. A of Burrows et al. (2018).

Photographic credits Maputo Elephant Reserve, Maputo Province. photo: M. Stalmans.

RLE Assessment

Assessment Summary	Assessment Information
This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**	**Criterion A:** Expansion of urban areas, agriculture & deforestation has caused a 22.83% decline since 1750. Least Concern **Criterion B:** This ecosystem has an AOO of 29 10 x 10 km grid cells and an EOO of 6682.87 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern **Criterion C:** Not evaluated **Criterion D:** Degradation assessment shows that 1.46% of the current distribution faces >90 percent degradation severity, 16.51% of the distribution faces >70 percent degradation severity, and 53.74% of the distribution faces >50 percent degradation severity. Least Concern **Criterion E:** Not evaluated

INHAMBANE DUNE THICKET

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Brenha das dunas de Inhambane
Biome Supralittoral coastal systems (MT2)
Functional group Coastal shrublands and grasslands (MT2.1)
Regional Ecosystem Tropical Dune Forest

Description

Semi-deciduous to evergreen dune thicket. This unit represents some of the various successional communities within close proximity to the sea and may include sparsely vegetated dunes, short thicket-like dune vegetation, and young to maturing forest on dunes. Canopy height is usually no taller than 6 m and comprises a single stratum of small trees and woody shrubs with scattered emergent taller trees.

Distribution

From the Limpopo River mouth at Xai Xai, northwards as far as the Save River mouth. Occurring in Gaza and Inhambane Provinces.

Characteristic native biota

Trees and woody shrubs are *Acacia kraussiana, A. robusta* var. *usambarensis, Acokanthera oblongifolia, Acridocarpus natalitius, Afzelia quanzensis, Albizia adianthifolia, A. versicolor, Brachylaena discolor, Brexia madagascariensis, Bridelia cathartica, Cassipourea mossambicensis, Catunaregam obovata, Clerodendrum glabrum, Commiphora neglecta, C. schimperi, C. schlechteri, C. zanzibarica, Coptosperma littorale, Cordia caffra* var. *caffra, Craibia zimmermannii, Croton pseudopulchellus, Cussonia arenicola, Diospyros inhacaensis, D. natalensis, D. rotundifolia, Dovyalis longispina, Drypetes arguta, D. reticulata, Elaeodendron fruticosum, Empogona coriacea, Erythrophleum lasianthum, Euclea natalensis* subsp. *obovata, E. racemosa* subsp. *sinuata, Eugenia capensis* subsp. *capensis, Eugenia mossambicensis, E.* sp. A. of Burrows *et al.*, 2018, *Euphorbia lividiflora, E. tirucalli, Ficus tremula, Flacourtia indica, Garcinia livingstonei, Grewia occidentalis* var. *littoralis, G. caffra, G. sulcata, Gymnosporia arenicola, Haplocoelum foliolosum* subsp. *mombasense, Hilsenbergia petiolaris, Maclura africana, Manilkara discolor, Memecylon insulare, Mimusops caffra* (subdominant), *Mystroxylon aethiopicum, Ochna barbosae, Ozoroa obovata, Pavetta gerstneri, Phoenix reclinata, Psydrax moggii, Pteleopsis myrtifolia, Searsia natalensis, Sideroxylon inerme* (subdominant), *Sphaerocoryne gracilis, Strychnos gerrardii, S. henningsii, Suregada zanzibariensis, Tarenna junodii, Trichilia emetica, Vepris gerrardii, Warneckea sansibarica, Xylotheca kraussiana* (subdominant), *Zanthoxylum delagoense*, and *Ziziphus pubescens.*

The cycad *Encephalartos ferox* frequently occurs in, or is associated with, Inhambane Dune Thicket.

Climbers and lianes include *Acacia kraussiana, Ancylobotrys petersiana, Artabotrys brachypetalus, Capparis sepiaria* var. *citrifolia, Cissampelos hirta, Cissus quadrangularis, C. rotundifolia, Cynanchum ellipticum, C. gerrardii,*

Combretum butyrosum, C. pisoniiflorum, Entada wahlbergii, Flagellaria guineensis, Landolphia kirkii, Macrotyloma axillare var. *axillare, Rhoicissus revoilii, Secamone filiformis, Strychnos panganensis,* and *Vanilla roscheri.*

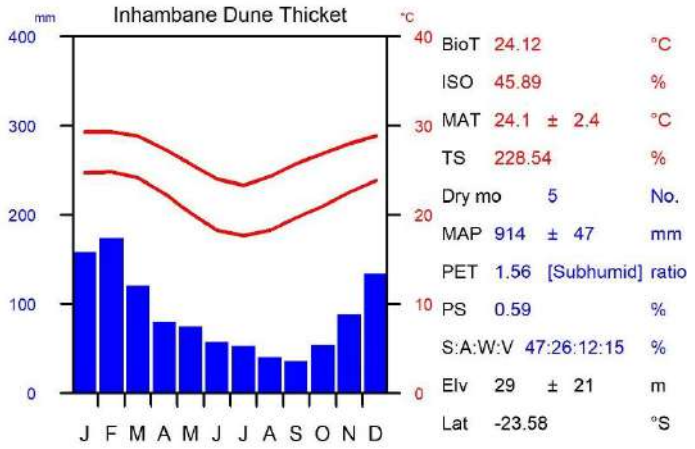
Soft shrubs and herbaceous species found either in or under the dune thicket, or in open areas around the thicket are: *Alysicarpus vaginalis* var. *vaginalis, Asystasia gangetica, Barleria delagoensis, B. repens, Ceropegia distincta, Corchorus junodii, Crotalaria dura, Ecbolium hastatum, Elephantorrhiza elephantina, Eriosema parviflorum* (freshwater marsh), *Eulophia petersii, Euphorbia ambroseae* var. *ambroseae, E. baylissii, Helichrysum kraussii, Hermannia micropetala, Indigofera podophylla, Jatropha subaequiloba, Kalanchoe leblanciae, Melhania forbesii, Microsorum scolopendria, Oeceoclades decaryana, Oncocalyx bolusii, Rhynchosia caribaea, Salacia kraussii, Sansevieria concinna, Sesbania bispinosa, Teramnus repens* subsp. *gracilis,* and *Zamioculcas zamiifolia.*

Grasses found in clearings and margins of thicket include *Chloris pycnothrix, Enteropogon macrostachyus, Eragrostis moggii, Panicum nervatum,* and *Perotis patens.*

Abiotic environment and climate

Altitude range of 3 to 80 m asl with a mean of 29 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 70.6% while the similarly measured clay content is 16.9%. Soil pH is 5.9.

Precipitation during driest quarter is 98.6 mm.



Species of Conservation Importance

Endemic Plant Species

Ecbolium hastatum [E], *Elaeodendron fruticosum* [E], *Euphorbia baylissii* [E], *Jatropha subaequiloba* [E*], *Memecylon insulare* [E*], *Solanum litoraneum* [E], *Triaspis suffulta* [E].

Threatened Plant Species

Ecbolium hastatum [EN], *Euphorbia baylissii* [VU], *Jatropha subaequiloba* [VU*], *Memecylon insulare* [CR*], *Solanum litoraneum* [EN].

Biogeographic Anomalies

Encephalartos ferox, *Eugenia* sp. A. of Burrows *et al.*, 2018.

Photographic credits Dune thicket at Chidenguele, Gaza Province. photo: J. Burrows

RLE Assessment

Assessment Summary	Assessment Information
This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**	**Criterion A:** Expansion of urban areas, agriculture & deforestation has caused a 31.06% decline since 1750. Least Concern **Criterion B:** This ecosystem has an AOO of 60 10 x 10 km grid cells and an EOO of 45651.65 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern **Criterion C:** Not evaluated **Criterion D:** Not evaluated **Criterion E:** Not evaluated

ROVUMA DUNE THICKET

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Brenha das dunas do Rovuma
Biome Supralittoral coastal systems (MT2)
Functional group Coastal shrublands and grasslands (MT2.1)
Regional Ecosystem Tropical Dune Forest

Description

This is a low, dense, evergreen thicket that occurs on deep, wind-blown white sands along the coastline. Canopy height is usually no taller than 4 m and comprises a single stratum of small trees and woody shrubs with scattered emergent taller trees.

Distribution

From Pebane, northwards along the coast and into Tanzania. Occurring in Cabo Delgado, Nampula and Zambezia Provinces.

Characteristic native biota

This is mainly a low, dense, evergreen thicket that occurs on deep, wind-blown white sands along the coastline. Canopy height is usually no taller than 4 m and usually comprises a single stratum of small trees and woody shrubs, sometimes with patches of taller but still stunted forest. In the southern parts (Zambezia Province) of this vegetation type the trees include *Brachystegia oblonga, Euclea racemosa* subsp. *sinuata, Hirtella zanzibarica, Hymenaea verrucosa, Icuria dunensis, Ludia mauritiana, Millettia stuhlmannii, Mimusops caffra, M. zeyheri, Pseudobersama mossambicensis, Scorodophloeus torrei* and *Sideroxylon inerme.* Shrubs and small trees include *Cola mossambicensis, Combretum constrictum, Dracaena mannii, Erythroxylum platycladum, Eugenia capensis* subsp. *multiflora, Grewia glandulosa, Huberantha mossambicensis, Hugonia elliptica, Leptactina delagoensis, Maclura africana, Pemphis acidula, Rytigynia umbellulata, Sclerochiton coeruleus, Sphaerocoryne gracilis, Sophora tomentosa* var. *tomentosa, Tristellateia africana*. Lianes and climbers include *Ancylobotrys petersiana, Canavalia gladiata, Salacia madagascariensis* and *Toddalia asiatica.*

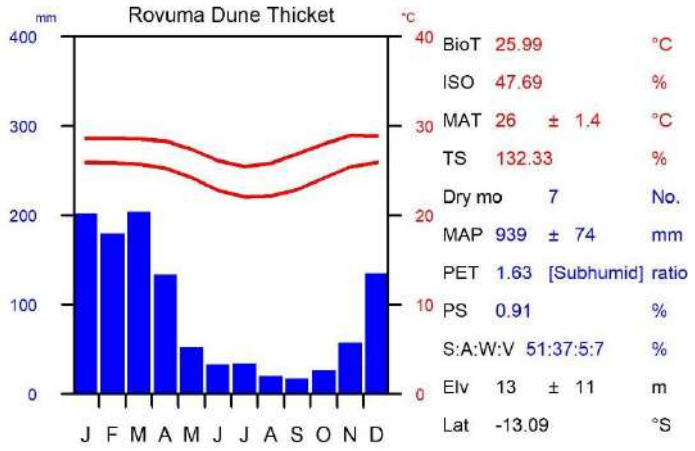
In the northern extreme of this vegetation type (Cabo Delgado Province), the dominant species, many of which are also diagnostic, are *Coptosperma littorale, C. nigrescens, Warneckea sansibarica, Diospyros consolatae, D. natalensis, Eugenia capensis* subsp. *multiflora, Euclea natalensis, Ozoroa obovata, Haplocoelum inoploeum, Euphorbia tirucalli, Strychnos henningsii, Mystroxylon aethiopicum, Erythroxylum emarginatum, Hyphaene coriacea, Pyrostria phyllanthoidea* and *Grewia glandulosa*. Scattered emergent trees include *Hymenaea verrucosa, Commiphora serrata, Sideroxylon inerme, Manilkara mochisia* and *Afzelia quanzensis*. The undergrowth is generally sparse but does include *Barleria repens, Microsorum scolopendria, Zamioculcas zamiifolia, Sansevieria subspicata, Eulophia petersii* and *Combretum pisoniiflorum*. Woody and succulent climbers include *Strychnos panganensis, Cissus quadrangularis, Vanilla roscheri* and *Rhoicissus revoilii.*

Patches of dune thicket that occur further inland on the Afungi Peninsula have a different species composition, including *Scorodophloeus fischeri, Croton polytrichus* and *Phellocalyx vollesenii*, as well as restricted-range taxa such as *Xylopia tenuipetala, Memecylon aenigmaticum, Hexalobus mossambicensis, Ormocarpum schliebenii* and *Baphia punctulata* subsp. *palmensis.*

Abiotic environment and climate

Altitude range of 5 to 70 m asl with a mean of 13 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 58.9% while the similarly measured clay content is 24.7%. Soil pH is 6.2.

Precipitation during driest quarter is 29.6 mm.



Species of Conservation Importance

Endemic Plant Species

Baphia punctulata subsp. *palmensis* [E], Icuria *dunensis* [E] – in southern part of vegetation unit, *Xylopia tenuipetala* [E].

Threatened Plant Species

Icuria dunensis [EN], *Paracephaelis trichantha* [VU], *Xylopia tenuipetala* [EN], *Memecylon aenigmaticum* [CR].

Biogeographic Anomalies

Memecylon aenigmaticum – isolated population approximately 100 km from only other known population.

Photographic credits *top left & right*: Palma area, Cabo Delgado. photos: W. McCleland; *below*: thicket near Olumbe, Palma District, Cabo Delgado Province. photo: J. Burrows.

RLE Assessment

Assessment Summary	Assessment Information
This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**	**Criterion A:** Expansion of urban areas, agriculture & deforestation has caused a 35.16% decline since 1750. Least Concern **Criterion B:** This ecosystem has an AOO of 33 10 x 10 km grid cells and an EOO of 40702.78 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern **Criterion C:** Not evaluated **Criterion D:** Not evaluated **Criterion E:** Not evaluated

ZAMBEZI CHENIER DUNE THICKET

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Brenha das dunas frontais da foz do Zambeze
Biome Supralittoral coastal systems (MT2)
Functional group Coastal shrublands and grasslands (MT2.1)
Regional Ecosystem Tropical Dune Forest

Description

Dune vegetation is located along sandy wave-swept or wave-deposited ridges, or Cheniers, running parallel to the shoreline but occasionally at other angles due to shifting or eroded landscape. "Chenier" is the Louisiana French term for the oak tree belts that mark the distribution of the ridges in the Mississippi Delta region, and a chenier plain consists of cheniers separated by intervening mud-flats with marsh or grassy vegetation. The ridges are usually composed of sand-sized material resting on clay or mud. This unit therefore includes the parallel dunes and inter-dune slacks. Chenier plains are associated with shorelines characterized by generally low wave energy, low gradient, muddy shorelines, and abundant sediment supply.

The vegetation of the parallel dune ridges and slacks is a mosaic of species related to successional status, soil moisture, and salinity.

Distribution

From just north of the Save River mouth, northwards to Moma. Occurring in Sofala and Zambezia Provinces.

Characteristic native biota

Comprising dune ridges and dune slacks or depressions between the dune ridges.

Near the foredunes, typical species include *Brexia madagascariensis, Diospyros natalensis. Coptosperma littorale, Eugenia capensis subsp. multiflora, Flacourtia indica, Macphersonia gracilis var. hildebrandtii*, *Maerua triphylla, Mimusops caffra, Searsia natalensis, Argusia argentea,* and *Vepris lanceolata*. Grass cover on the dunes is sparse but includes tufts of *Halopyrum mucronatum.*

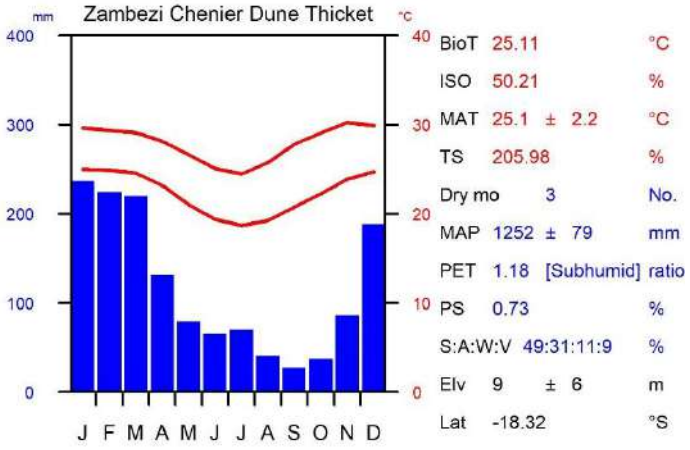
Further inland from the coast, dune thicket gives way to various associations of taller woodland, including a mosaic of *Hyphaene coriacea, Parinari curatellifolia, Strychnos madagascariensis*, and *Vitex spp*. on wet sands, sometimes with *Albizia adianthifolia*, and slightly drier associations of *Borassus aethiopum* and *Phoenix reclinata palm, Acacia xanthophloea, Combretum imberbe, Kigelia africana, Philenoptera violacea* and *Trichilia emetica,* with *Barringtonia racemosa* on the edge of mangrove forests.

Dune slacks colonised by *Acacia xanthophloea, Cassia abbreviata subsp. beareana, Hyphaene coriacea* and *Swartzia madagascariensis*, with shrublets such as *Cleome stricta, Crotalaria laburnoides* and *Mimosa diplotricha var. inermis*. Grass species include *Eragrostis chapelieri, Hyperthelia dissoluta, Pogonarthria squarrosa,* and *Themeda triandra*, with *Setaria sphacelata* in more saline areas, and *Hyparrhenia filipendula*, *Imperata cylindrica*, *Chrysopogon nigritanus*, and others on slightly higher ground.

Abiotic environment and climate

Altitude range of 4 to 20 m asl with a mean of 9 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 60.1% while the similarly measured clay content is 26.1%. Soil pH is 6.4.

Precipitation during driest quarter is 60 mm.



Species of Conservation Importance

Endemic Plant Species

Blepharis dunensis [E], *Brachystegia oblonga* [E], *Cordia stuhlmannii* [E], *Eulophia biloba* [E], *Habenaria mosambicensis* [E], *Huberantha mossambicensis* [E*], *Ochna beirensis* [E], *Psydrax micans* [NE], *Scorodophloeus torrei* [E], *Teclea crenulata* [E].

Threatened Plant Species

Blepharis dunensis [EN], *Brachystegia oblonga* [CR], *Cordia stuhlmannii* [VU], *Huberantha mossambicensis* [CR*], *Ochna beirensis* [EN], *Scorodophloeus torrei* [EN], *Teclea crenulata* [DD].

Photographic credits Chenier dunes in the Zambezi River delta. photos: M. Stalmans.

RLE Assessment

Assessment Summary

This ecosystem has a restricted geographic distribution with substantial evidence of historical declines due to the expansion of urban areas, agriculture, and deforestation throughout in the extent. **Vulnerable**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 66.8% decline since 1750. Vulnerable

Criterion B: This ecosystem has an AOO of 85 10 x 10 km grid cells and an EOO of 63734.8 km2. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 4.83% of the current distribution faces >90 percent degradation severity, 23.88% of the distribution faces >70 percent degradation severity, and 75.82% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

3.1.6 Realm Marine-Freshwater-Terrestrial

3.1.6.1 Biome: MFT1 Brackish tidal systems

MFT1.3 Coastal saltmarshes and reedbeds

SUBTROPICAL COASTAL SALT MARSHES

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Sapais subtropicais
Biome Brackish tidal systems (MFT1)
Functional group Coastal saltmarshes and reedbeds (MFT1.3)
Regional Ecosystem Subtropical Zone Estuary

Description

Flat halophytic and tidal mud flats near river mouths that may support mangrove forests; or mud coastal flats with scattered or dense samphires (*Salicornia* and *Sarcocornia*). These mud flats are dark, clayey alluvium of marine origin, rich in organic matter. They are inundated by seawater at high tides, exposed during low tides, and flooded by freshwater during the rainy season. They support well-developed stands of mangrove forest in deeper water and salt marsh species in the shallower areas. Density of salt marsh varies considerably with more dense vegetation further inland where it is shallower.

Distribution

Mud flats south of Inhambane. Also extending into South Africa. Occurring in Inhambane and Maputo Provinces.

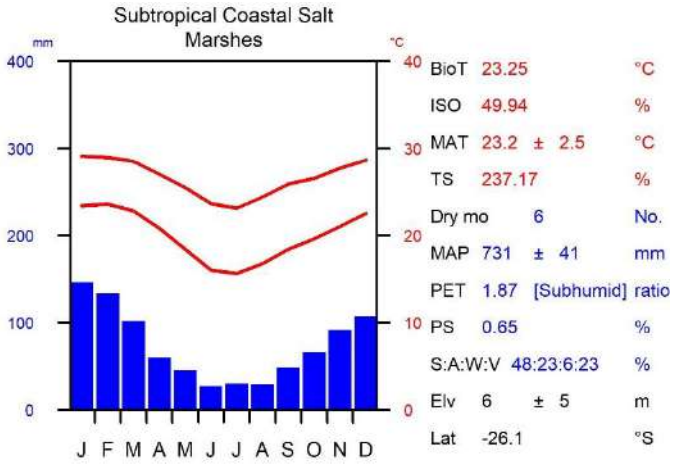
Characteristic native biota

Sparse to densely vegetated and may be composed of *Salicornia* spp., *Sarcocornia* spp., *Hibiscus tiliaceus* is common in the ecotone between the mudflats and coastal sand dunes.

Abiotic environment and climate

Altitude range of 0 to 25 m asl with a mean of 6 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 45.7% while the similarly measured clay content is 33.6%. Soil pH is 6.4.

Precipitation during driest quarter is 60 mm.



Species of Conservation Importance: none recorded.

Photographic credits Inhaca island, Maputo Province. photo. M. Stalmans.

RLE Assessment

Assessment Summary

This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 26.51% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 19 10 x 10 km grid cells and an EOO of 3018.94 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 10.15% of the current distribution faces >90 percent degradation severity, 28.07% of the distribution faces >70 percent degradation severity, and 58.22% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

TROPICAL COASTAL SALT MARSHES

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.

Portuguese ecosystem name Sapais tropicais

Biome Brackish tidal systems (MFT1)

Functional group Coastal saltmarshes and reedbeds (MFT1.3)

Regional Ecosystem Tropical Zone Estuary

Description

Flat halophytic and tidal mud flats near river mouths that may support mangrove forests; or mud coastal flats with scattered or dense samphires (*Salicornia* and *Sarcocornia*). These mud flats are dark, clayey alluvium of marine origin, rich in organic matter. They are inundated by seawater at high tides, exposed during low tides, and flooded by freshwater during the rainy season. They support well-developed stands of mangrove forest in deeper water and salt marsh species in the shallower areas. Density of salt marsh varies considerably with more dense vegetation further inland where it is shallower. Tinley (1977) reported that some of these mudflats are bare and were once covered with mangrove, until sediments trapped by mangrove roots accumulated above the high tide level and created super-saline conditions too toxic for the mangroves to persist.

Distribution

Coastal mud flats north of Inhambane. Occurring in Cabo Delgado, Inhambane, Nampula, and Zambezia Provinces. Also extending into Tanzania.

Characteristic native biota

Although sparsely wooded, trees and palms recorded are *Euclea racemosa* subsp. *sinuata, Euphorbia lividiflora, Ficus sur, Hyphaene coriacea, Phoenix reclinata, Salvadora persica*, while small trees and woody shrubs include *Encephalartos ferox* subsp. *emersus* (on old raised termitaria), *Erica natalitia, Gymnosporia arenicola, G. senegalensis, Morella serrata, Psydrax moggii*, and *Sesbania sesban*. *Avicennia marina* may be present nearer the sea.

Soft shrubs and herbaceous species are *Bacopa monnieri, Blumea axillaris, Chamaecrista capensis, Dicerocaryum senecioides, Eulophia angolensis, E. speciosa, Falkia oblonga, Helichrysopsis septentrionalis, Heliotropium ovalifolium, Hermannia micropetala, Hibiscus diversifolius* subsp. *rivularis, Hydrocotyle verticillata, Indigofera delagoensis, I. inhambanensis, I. podophylla, Litogyne gariepina, Lobelia erinus, Mimosa pigra, Nidorella resedifolia, Pentodon pentandrus* subsp. *minor*, *Phyla nodiflora, Oxygonum delagoense, Rhynchosia totta* var. *totta, Stylosanthes fruticosa, Tritonia moggii,* and *Vahlia capensis*. Two ferns recorded are *Acrostichum aureum* and *Cyclosorus interruptus*. Open salt flats are frequently covered in fleshy/succulent members of the Amaranthaceae (*Caroxylon littorale, Salicornia polystachya, Sarcocornia mossambicensis*), *Sesuvium portulacastrum* and the shrub *Suaeda monoica.*

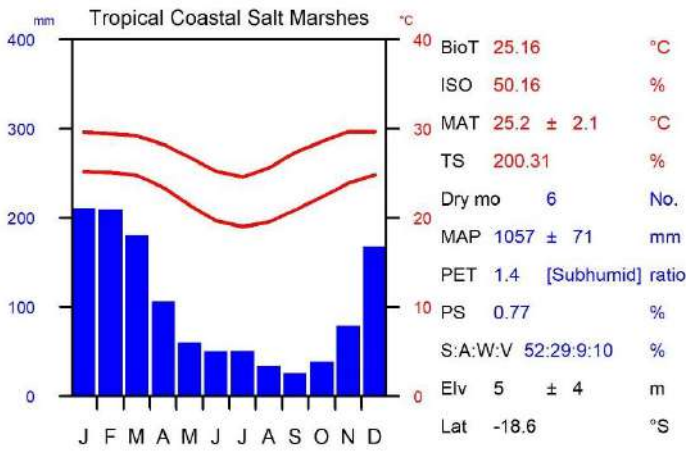
The larger graminoid plants such as *Cyperus papyrus*, *Phragmites australis* and *Typha latifolia* may be extensive, particularly in the Zambezi delta, but others include the grasses *Andropogon eucomus* subsp. *huillensis, Chrysopogon nigritanus, C. serrulatus, Craspedorhachis africana, Cynodon dactylon, C. laevigatus, Dactyloctenium geminatum, D. giganteum, Diplachne fusca, Echinochloa colona, E. pyramidalis, Eriochloa borumensis, Halopyrum mucronatum, Hemarthria altissima, Imperata cylindrica, Ischaemum afrum, I. fasciculatum, Leersia hexandra*, *Odyssea paucinervis, Panicum maximum, P. repens, Paspalidium obtusifolium, Paspalum vaginatum, Pennisetum polystachion* subsp. *polystachion, Sporobolus virginicus*, and *Urochloa mossambicensis.*

Sedges recorded are *Bolboschoenus maritimus, Bulbostylis schoenoides, Cladium mariscus, Cyperus angolensis, C. compressus, Cyperus digitatus, C. laevigatus, C. procurus, Eleocharis acutangula, Fimbristylis bivalvis, F. cymosa, Fuirena umbellata, Pycreus nitidus, Rhynchospora rubra* subsp. *africana*.

Abiotic environment and climate

Altitude range of 2 to 16 m asl with a mean of 5 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 46.6% while the similarly measured clay content is 33.5%. Soil pH is 6.3.

Precipitation during driest quarter is 52.1 mm.



Species of Conservation Importance

Endemic Plant Species

Ammannia moggii [E*], *Ammannia pedroi* [E], *Encephalartos ferox* subsp. *emersus* [E], *Eriocaulon infaustum* [E].

Threatened Plant Species

Ammannia moggii [CR*], *Ammannia pedroi* [VU].

Photographic credits *left & right*: Save River delta, Sofala Province. photos: M. Stalmans.

RLE Assessment

Assessment Summary

This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 15.48% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 238 10 x 10 km grid cells and an EOO of 354741.78 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Degradation assessment shows that 0.47% of the current distribution faces >90 percent degradation severity, 6.13% of the distribution faces >70 percent degradation severity, and 28.63% of the distribution faces >50 percent degradation severity. Least Concern

Criterion E: Not evaluated

MFT1.2 Intertidal forests and shrublands

TROPICAL INDIAN OCEAN AFRICAN MANGROVE

Authors Lötter, M.C., Burrows, J.E., Stalmans, M., McCleland, W., Schmidt, E., Darbyshire, I., Richards, S., Soares, M.G., Tsakalos, J.L, Grantham, H., Jones, K., Duarte, E., Matimele, H. & Costa, H.M.
Portuguese ecosystem name Mangal do Índico Ocidental
Biome Brackish tidal systems (MFT1)
Functional group Coastal saltmarshes and reedbeds (MFT1.3)
Regional Ecosystem Tropical Indian Ocean Mangrove

Description

Mangrove forests are generally a species-poor community occupying tidal areas in river estuaries and sheltered bays. They provide a very important ecological function.

Distribution

Along the coast of Mozambique, extending north and south of the country. Occurring along all the coastal provinces.

Characteristic native biota

A species-poor but highly specialized community with distinct zonation into the few species that are partially submerged at high-tide, and those that are only briefly inundated at spring tide or during severe storms, the latter forming the back-mangrove. The seaward community is made up throughout Mozambique by *Avicennia marina, Bruguiera gymnorrhiza, Ceriops tagal, Rhizophora mucronata* and *Sonneratia alba* – the latter often growing furthest out to sea and sometimes off coral beaches. Just above normal high-tide mark occurs *Heritiera littoralis, Lumnitzera racemosa* and *Xylocarpus granatum*.

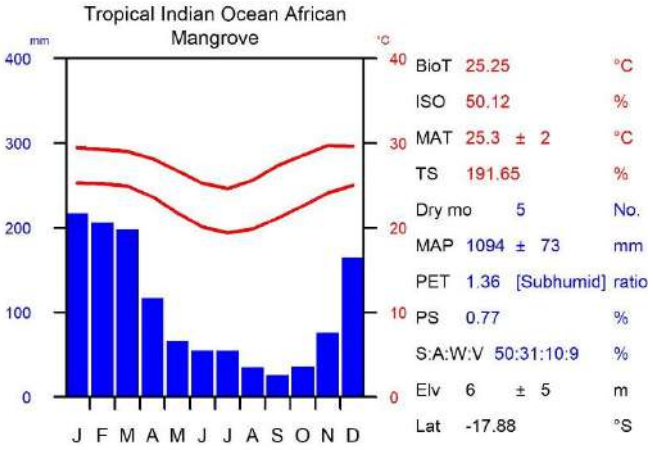
Often where a freshwater influence is experienced, *Barringtonia racemosa, Derris trifoliata, Entada rheedii, Hibiscus tiliaceus, Thespesia populnea* and the mangrove fern, *Acrostichum aureum*, may be dominant. The back-mangrove also attracts *Brexia madagascariensis, Pemphis acidula, Phoenix reclinata, Premna serratifolia, Suriana maritima* and the narrow endemic *Eriolaena rulkensii* in Pemba Bay. Low herbs such as *Arthrocnemum indicum, Chenolea diffusa, Salicornia* spp., *Sesuvium portulacastrum* and graminoids such as *Dactyloctenium geminatum, Fimbristylis obtusifolia, Juncus kraussii* and *Sporobolus virginicus* also occur here.

While most of these species mentioned occur along the length of Mozambique, *Heritiera littoralis, Pemphis acidula, Premna serratifolia, Sonneratia alba* and *Suriana maritima* all extend no further south than Inhambane. The biogeographically important *Xylocarpus moluccensis* has been recorded in the Zambezi delta and Memba areas.

Abiotic environment and climate

Altitude range of 2 to 16 asl with a mean of 6 m. Sand content, expressed as % between 1 – 30 cm deep, is an estimated 46.4% while the similarly measured clay content is 33.2%. Soil pH is 5.8.

Precipitation during driest quarter is 52.9 mm.



Species of Conservation Importance

Endemic Plant Species

Eriolaena rulkensii [E], *Viscum littorum* [E].

Threatened Plant Species

Eriolaena rulkensii [EN].

Photographic credits *top*: Zambezi River delta; *bottom:* Machangulo, Maputo Province. photos: M. Stalmans.

RLE Assessment

Assessment Summary

This ecosystem has a restricted distribution, but there is little evidence of large declines in extent or degradation. **Least Concern**

Assessment Information

Criterion A: Expansion of urban areas, agriculture & deforestation has caused a 9.02% decline since 1750. Least Concern

Criterion B: This ecosystem has an AOO of 274 10 x 10 km grid cells and an EOO of 441863.41 km2. Despite having a restricted geographic distribution, there was insufficient evidence of ongoing declines in extent to qualify as threatened under criterion B. Least Concern

Criterion C: Not evaluated

Criterion D: Not evaluated

Criterion E: Not evaluated

4. ECOSYSTEM ASSESSMENT

4.1 Detailed RLE assessment and outcomes

Overall, 193,293 km^2 (24.5%) of Mozambique's terrestrial area has been converted to human land uses (agriculture and urban areas), leaving approximately 593,720 km2 (75.5%) of natural areas remaining in at the end of 2020. Applying the IUCN RLE criteria to Mozambique's terrestrial ecosystems resulted in an initial classification of 7 Critically Endangered (4.32%), 15 Endangered (9.25%), and 62 Vulnerable ecosystems (38.2%;; Table 4.1; Figure 4.1). Spatially, threatened ecosystems are concentrated in coastal regions as well as many inland parts in the mid and north of Mozambique.

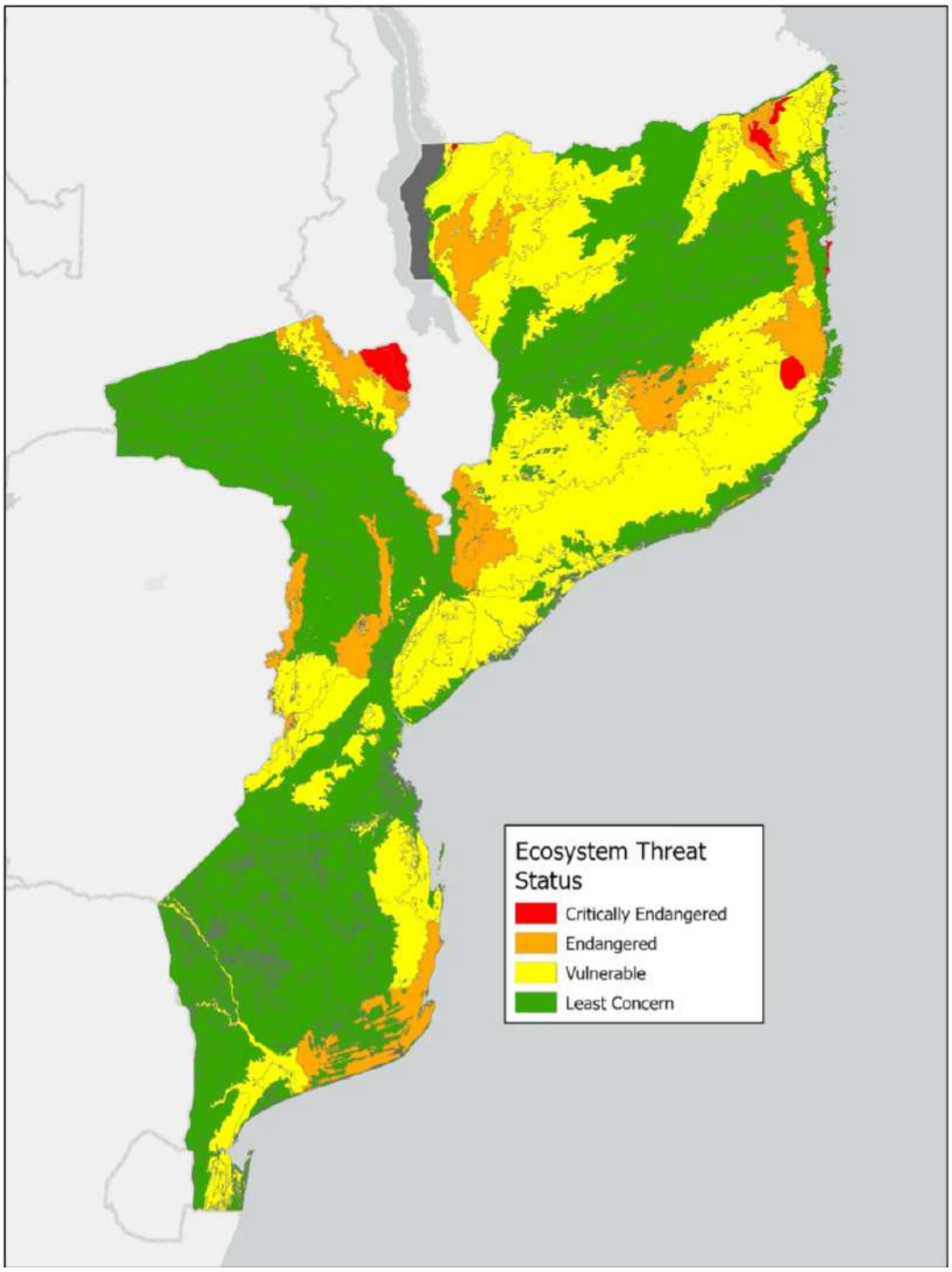


Figure 4.1 – Overall threat status for Mozambique's ecosystems.

Table 4.1 – Overall Ecosystem status based on RLE assessment, with details for Criterion A & B (full details and data for other criteria available in appendix xx)

Name	Realm	Biome	Historical Area (km²)	Current Area (km²)	Extent of Occurrence (km²)	AOO* (#10km grid cells)	Overall Status
Amaramba Moist Miombo	Terrestrial	T4 Savannas and grasslands	14112.31	9973.73	24142.72	215	Least Concern
Amatonga Lowland Semideciduous Forest	Terrestrial	T1 Tropical-subtropical forests	1184.94	815.68	2431.22	26	Vulnerable
Angonia Escarpment Miombo	Terrestrial	T4 Savannas and grasslands	7233.80	5337.83	18049.21	144	Vulnerable
Angonia Gneiss Montane Miombo	Terrestrial	T4 Savannas and grasslands	2307.57	189.52	2953.47	30	Critically Endangered
Angonia Montane Moist Miombo	Terrestrial	T4 Savannas and grasslands	199.92	87.90	2844.92	9	Endangered
Bangomatete Rhyolite Dry Woodland	Terrestrial	T4 Savannas and grasslands	592.92	550.97	4919.74	33	Least Concern
Banhine Inland Salt Pans	Freshwater	F2 Lakes	4137.46	3656.61	38176.57	138	Least Concern
Barue Escarpment Miombo	Terrestrial	T4 Savannas and grasslands	5334.57	4708.80	9705.65	89	Least Concern
Barue Plateau Moist Miombo	Terrestrial	T4 Savannas and grasslands	10681.17	7894.88	14045.29	136	Least Concern
Bilene Coastal Forest	Terrestrial	T1 Tropical-subtropical forests	3085.10	2278.52	15938.55	96	Least Concern
Buzi-Pungwe Alluvial Vegetation	Terrestrial	T4 Savannas and grasslands	3333.39	2053.13	14151.42	78	Least Concern
Canxixe Lowland Dry Woodland	Terrestrial	T4 Savannas and grasslands	9227.74	6904.30	12955.94	135	Least Concern
Central Lowland Moist Forest	Terrestrial	T1 Tropical-subtropical forests	1232.11	731.39	42997.31	40	Vulnerable
Central Mid-elevation Moist Forest	Terrestrial	T1 Tropical-subtropical forests	322.44	237.88	37044.61	35	Vulnerable
Central Montane Forest	Terrestrial	T1 Tropical-subtropical forests	42.81	35.30	11215.38	9	Vulnerable
Central Submontane Forest	Terrestrial	T1 Tropical-subtropical forests	147.30	117.88	18009.37	25	Vulnerable
Cheringoma Coastal Moist Miombo	Terrestrial	T4 Savannas and grasslands	6301.63	5900.07	15957.92	106	Vulnerable
Cheringoma Coastal Palm Savanna	Terrestrial	T4 Savannas and grasslands	1681.51	1533.50	3011.46	39	Least Concern
Cheringoma Escarpment Moist Miombo	Terrestrial	T4 Savannas and grasslands	1680.09	1432.92	3048.57	39	Vulnerable
Cheringoma Limestone Gorge Forest	Terrestrial	T1 Tropical-subtropical forests	183.14	169.43	517.08	10	Vulnerable
Cheringoma Plateau Moist Miombo	Terrestrial	T4 Savannas and grasslands	4207.68	3961.64	5928.42	72	Vulnerable
Chimanimani Montane Grassland	Terrestrial	T4 Savannas and grasslands	295.35	289.34	769.74	11	Least Concern
Chimanimani Montane Miombo	Terrestrial	T4 Savannas and grasslands	1196.86	611.67	5996.49	41	Vulnerable
Chimoio Moist Miombo	Terrestrial	T4 Savannas and grasslands	5515.74	2427.40	6975.45	79	Vulnerable
Chitonga Montane Wooded Grassland	Terrestrial	T4 Savannas and grasslands	139.79	91.97	376.62	7	Critically Endangered
Choa Escarpment Moist Miombo	Terrestrial	T4 Savannas and grasslands	3149.34	1651.54	6450.90	62	Endangered
Coastal Berlinia Miombo	Terrestrial	T4 Savannas and grasslands	2451.28	1806.28	5627.24	55	Vulnerable
Coastal Lagoons	Freshwater-Marine	FM1 Semi-confined transitional waters	130.95	130.00	10752.44	16	Not Assessed
Dombe Basalt Dry Woodland	Terrestrial	T4 Savannas and grasslands	3768.59	2396.15	7877.98	68	Least Concern
Dombe Escarpment Miombo	Terrestrial	T4 Savannas and grasslands	5938.16	4180.72	10541.31	93	Vulnerable
Freshwater Lake	Freshwater	F2 Lakes	7476.77	7167.74	685371.56	173	Not Assessed
Gaza Sandy Guibourtia Woodland	Terrestrial	T4 Savannas and grasslands	14806.20	13730.74	43660.13	337	Least Concern
Gorongosa Escarpment Moist Miombo	Terrestrial	T4 Savannas and grasslands	446.11	220.12	4078.60	15	Endangered
Gorongosa Foothills Moist Miombo	Terrestrial	T4 Savannas and grasslands	4011.81	2679.84	5568.21	61	Endangered
Gorongosa Montane Grassland	Terrestrial	T4 Savannas and grasslands	40.01	31.90	119.28	3	Endangered
Guro Dry Woodland	Terrestrial	T4 Savannas and grasslands	10540.04	7668.13	18148.01	145	Least Concern
Gurue Plateau Moist Miombo	Terrestrial	T4 Savannas and grasslands	7003.42	2165.39	18347.54	148	Vulnerable
Icuria Coastal Forest	Terrestrial	T1 Tropical-subtropical forests	214.21	74.26	7358.18	15	Endangered
Inhambane Coastal Miombo	Terrestrial	T4 Savannas and grasslands	13187.68	3697.58	27548.54	227	Endangered
Inhambane Dune Thicket	Marine-Terrestrial	MT2 Supralittoral coastal systems	500.88	345.32	45651.65	60	Least Concern
Inhamitanga Sand Forest	Terrestrial	T1 Tropical-subtropical forests	2009.57	1774.42	11462.33	68	Vulnerable
Inharrime Coastal Palm Savanna	Terrestrial	T4 Savannas and grasslands	5265.79	3921.08	20600.62	155	Least Concern
Ironwood Dry Forest	Terrestrial	T1 Tropical-subtropical forests	4173.35	3997.53	123319.70	418	Least Concern

Name	Realm	Biome	Historical Area (km²)	Current Area (km²)	Extent of Occurrence (km²)	AOO* (#10km grid cells)	Overall Status
Lake Niassa Lowland Miombo	Terrestrial	T4 Savannas and grasslands	1726.52	1436.04	7759.19	51	Least Concern
Lebombo-KwaZulu Natal Scarp Forest	Terrestrial	T4 Savannas and grasslands	36.30	35.33	857.37	10	Vulnerable
Lebombo Summit Sourveld	Terrestrial	T1 Tropical-subtropical forests	63.17	42.79	116.62	4	Least Concern
Lichinga Escarpment Moist Miombo	Terrestrial	T4 Savannas and grasslands	16799.30	14341.60	56592.91	318	Vulnerable
Lichinga Montane Moist Miombo	Terrestrial	T4 Savannas and grasslands	11065.67	6386.79	34479.62	174	Vulnerable
Lichinga Wooded Grassland	Terrestrial	T4 Savannas and grasslands	182.00	144.58	1732.40	11	Vulnerable
Licuati Sand Thicket	Terrestrial	T1 Tropical-subtropical forests	574.71	515.27	893.63	14	Vulnerable
Limpopo-Olifants Riverine Forest	Terrestrial	T4 Savannas and grasslands	103.20	86.16	38071.51	28	Least Concern
Limpopo Lowland Woodland	Terrestrial	T1 Tropical-subtropical forests	12338.62	8148.57	22968.48	192	Least Concern
Limpopo Ridge Mopane Woodland	Terrestrial	T4 Savannas and grasslands	5896.45	5052.52	24943.38	152	Least Concern
Lugenda Lowland Dry Miombo	Terrestrial	T4 Savannas and grasslands	23629.03	23450.70	39095.11	315	Least Concern
Luia Basalt Mopane Woodland	Terrestrial	T4 Savannas and grasslands	3617.50	3132.14	24619.50	82	Least Concern
Lupata Plateau Dry Woodland	Terrestrial	T4 Savannas and grasslands	1799.94	1630.96	3015.47	33	Least Concern
Lupilichi Escarpment Miombo	Terrestrial	T4 Savannas and grasslands	915.48	871.49	2018.98	24	Vulnerable
Lurio Riverine Forest	Terrestrial	T1 Tropical-subtropical forests	2.90	2.56	72134.45	0	Vulnerable
Lurio Valley Dry Miombo	Terrestrial	T4 Savannas and grasslands	26426.56	21053.70	59337.44	432	Least Concern
Mabu Moist Miombo	Terrestrial	T4 Savannas and grasslands	23197.58	11662.64	32072.29	294	Vulnerable
Macanga Montane Moist Miombo	Terrestrial	T4 Savannas and grasslands	6611.61	3649.19	17213.44	135	Least Concern
Macomia Lowland Deciduous Forest	Terrestrial	T1 Tropical-subtropical forests	4271.56	3418.22	8754.64	76	Vulnerable
Madanda Rubber Sand Thicket	Terrestrial	T1 Tropical-subtropical forests	4722.67	3323.16	10270.02	87	Vulnerable
Madanda Sand Forest	Terrestrial	T1 Tropical-subtropical forests	3315.38	2428.41	8183.73	68	Least Concern
Madanda Sandstone Dry Woodland	Terrestrial	T4 Savannas and grasslands	3782.13	3217.80	8759.53	70	Least Concern
Magoe Sandstone Mopane Woodland	Terrestrial	T4 Savannas and grasslands	8535.60	6858.28	22104.33	163	Least Concern
Makonde Bamboo Thicket	Terrestrial	T1 Tropical-subtropical forests	5489.90	5461.02	10223.18	102	Vulnerable
Malema Granite Escarpment Miombo	Terrestrial	T4 Savannas and grasslands	7706.11	5469.88	12774.21	125	Least Concern
Manda Moist Miombo	Terrestrial	T4 Savannas and grasslands	7062.98	6971.09	8737.47	102	Vulnerable
Manica Montane Grassland	Terrestrial	T4 Savannas and grasslands	459.12	344.27	6713.54	30	Least Concern
Maputaland Coastal Forest	Terrestrial	T1 Tropical-subtropical forests	249.29	241.64	1660.86	20	Vulnerable
Maputaland Coastal Wooded Grassland	Terrestrial	T4 Savannas and grasslands	1950.48	1448.61	9282.13	54	Least Concern
Maputaland Dune Forest	Marine-Terrestrial	MT2 Supralittoral coastal systems	163.17	125.92	6682.87	29	Least Concern
Maputaland Sand Forest	Terrestrial	T1 Tropical-subtropical forests	413.43	397.94	1023.17	16	Vulnerable
Maputo Alluvial Vegetation	Terrestrial	T4 Savannas and grasslands	7061.42	3003.82	62249.13	184	Vulnerable
Maputo Riverine Forest	Terrestrial	T1 Tropical-subtropical forests	8.18	7.86	1387.50	1	Vulnerable
Maravia Plateau Miombo	Terrestrial	T4 Savannas and grasslands	13502.83	10327.31	22575.59	223	Least Concern
Maringue Sandstone Dry Woodland	Terrestrial	T4 Savannas and grasslands	2703.34	1822.28	6025.45	54	Endangered
Marrupa Plateau Moist Miombo	Terrestrial	T4 Savannas and grasslands	7169.28	6491.73	12536.82	122	Vulnerable
Matondonvela Moist Miombo	Terrestrial	T4 Savannas and grasslands	24446.29	23676.99	42803.01	345	Vulnerable
Mazoe Gneiss Dry Thicket	Terrestrial	T1 Tropical-subtropical forests	1750.15	1529.61	4228.97	34	Least Concern
Mecufi Sandstone Dry Woodland	Terrestrial	T4 Savannas and grasslands	241.65	46.36	581.42	11	Critically Endangered
Mecula Summit Grassland	Terrestrial	T4 Savannas and grasslands	23.32	22.80	55.42	4	Vulnerable
Memba Dry Deciduous Lowland Forest	Terrestrial	T1 Tropical-subtropical forests	2420.70	1762.55	7826.45	51	Vulnerable
Memba Dry Miombo	Terrestrial	T4 Savannas and grasslands	10442.53	7293.79	17661.54	154	Endangered
Mocuba Moist Miombo	Terrestrial	T4 Savannas and grasslands	32601.54	26207.76	46566.72	414	Vulnerable
Monapo Klippe Dry Woodland	Terrestrial	T4 Savannas and grasslands	1482.64	289.38	1618.20	22	Critically Endangered

Name	Realm	Biome	Historical Area (km²)	Current Area (km²)	Extent of Occurrence (km²)	AOO* (#10km grid cells)	Overall Status
Montepuez Plateau Moist Miombo	Terrestrial	T4 Savannas and grasslands	16718.81	12068.74	26682.22	251	Least Concern
Morrumbala Lowland Moist Miombo	Terrestrial	T4 Savannas and grasslands	7721.62	4533.60	16652.57	129	Endangered
Morrumbala Plateau Moist Miombo	Terrestrial	T4 Savannas and grasslands	3154.51	1138.53	6816.00	48	Endangered
Mossurize Escarpment Miombo	Terrestrial	T4 Savannas and grasslands	2470.97	997.47	3766.86	41	Vulnerable
Mueda Dry Sand Thicket	Terrestrial	T1 Tropical-subtropical forests	710.96	706.49	1840.50	23	Vulnerable
Mueda Escarpment Miombo	Terrestrial	T4 Savannas and grasslands	2167.22	1358.42	6402.26	48	Endangered
Mueda Midslope Deciduous Forest	Terrestrial	T1 Tropical-subtropical forests	1442.98	335.10	3576.16	31	Endangered
Mueda Mixed Dry Miombo	Terrestrial	T4 Savannas and grasslands	5502.86	5380.02	19209.87	112	Vulnerable
Mueda Plateau Moist Forest	Terrestrial	T1 Tropical-subtropical forests	1007.12	117.10	1477.30	15	Critically Endangered
Nametil Moist Miombo	Terrestrial	T4 Savannas and grasslands	17220.60	10286.85	22633.39	227	Vulnerable
Nampula Coastal Palm Savanna	Terrestrial	T4 Savannas and grasslands	4055.00	2311.11	17174.27	103	Least Concern
Nampula Granite Escarpment Miombo	Terrestrial	T4 Savannas and grasslands	17391.26	9604.23	26979.75	241	Vulnerable
Nampula Ironwood Forest	Terrestrial	T1 Tropical-subtropical forests	24.12	23.54	90.00	3	Vulnerable
Namuli Montane Grassland	Terrestrial	T4 Savannas and grasslands	33.74	9.76	425.27	4	Endangered
Nangade Deciduous Newtonia Forest	Terrestrial	T1 Tropical-subtropical forests	510.43	273.97	752.24	14	Critically Endangered
Northern Coastal Dry Woodland	Terrestrial	T4 Savannas and grasslands	6174.01	4785.40	13634.66	115	Least Concern
Northern Inselberg Forest	Terrestrial	T1 Tropical-subtropical forests	2.46	2.43	1798.15	1	Vulnerable
Northern Inselberg Woodland	Terrestrial	T3 Shrublands & shrubby woodlands	6162.86	3870.09	214940.83	432	Least Concern
Northern Lebombo Bushveld	Terrestrial	T4 Savannas and grasslands	1683.67	1630.73	6736.72	51	Least Concern
Northern Lowland Moist Forest	Terrestrial	T1 Tropical-subtropical forests	94.39	85.15	43951.91	21	Vulnerable
Northern Mid-elevation Moist Forest	Terrestrial	T1 Tropical-subtropical forests	167.23	149.55	72103.92	30	Vulnerable
Northern Montane Forest	Terrestrial	T1 Tropical-subtropical forests	20.19	18.12	3761.79	4	Vulnerable
Northern Submontane Forest	Terrestrial	T1 Tropical-subtropical forests	70.44	64.17	85585.08	14	Vulnerable
Nungo Moist Miombo	Terrestrial	T4 Savannas and grasslands	16045.90	14443.15	27233.18	239	Least Concern
Nwambiya-Pumbe Sandy Bushveld	Terrestrial	T1 Tropical-subtropical forests	7379.82	6800.21	17231.86	153	Least Concern
Nwambiya Sand Thicket	Terrestrial	T4 Savannas and grasslands	2212.85	2121.42	7350.80	56	Least Concern
Pande Sand Thicket	Terrestrial	T1 Tropical-subtropical forests	732.53	548.29	2295.28	28	Vulnerable
Pangue Dry Miombo	Terrestrial	T4 Savannas and grasslands	24848.27	21924.82	37718.27	353	Least Concern
Pebane Sandy Shrub Miombo	Terrestrial	T4 Savannas and grasslands	7581.89	3809.75	16137.55	136	Least Concern
Ribaue Granite Escarpment Miombo	Terrestrial	T4 Savannas and grasslands	9328.87	5328.37	15220.83	148	Endangered
Rift Valley Floodplain Wooded Grassland	Terrestrial	T4 Savannas and grasslands	3887.16	2737.00	16345.06	97	Least Concern
Rift Valley Lowland Woodland	Terrestrial	T4 Savannas and grasslands	6113.83	4483.44	17728.64	116	Least Concern
Rovuma Alluvial Vegetation	Terrestrial	T4 Savannas and grasslands	1317.72	1042.80	16960.17	52	Least Concern
Rovuma Basin Coastal Forest	Terrestrial	T1 Tropical-subtropical forests	1709.04	1530.49	7667.97	55	Vulnerable
Rovuma Coastal Moist Miombo	Terrestrial	T4 Savannas and grasslands	1620.28	1431.92	3047.81	31	Vulnerable
Rovuma Coastal Wooded Grassland	Terrestrial	T4 Savannas and grasslands	979.83	672.75	5011.45	40	Least Concern
Rovuma Coral Rag Thicket	Marine-Terrestrial	MT2 Supralittoral coastal systems	175.63	148.27	10060.25	29	Vulnerable
Rovuma Dune Thicket	Marine-Terrestrial	MT2 Supralittoral coastal systems	180.77	117.21	40702.78	33	Least Concern
Rovuma Riverine Forest	Terrestrial	T1 Tropical-subtropical forests	15.99	13.88	71494.45	4	Vulnerable
Save Alluvial Vegetation	Terrestrial	T4 Savannas and grasslands	700.10	589.68	8261.27	51	Least Concern
Save Coastal Miombo	Terrestrial	T4 Savannas and grasslands	488.83	474.95	3915.12	36	Least Concern
Save Coastal Palm Savanna	Terrestrial	T4 Savannas and grasslands	2659.27	2547.80	6937.68	64	Least Concern
Save Lowland Dry Woodland	Terrestrial	T4 Savannas and grasslands	9701.07	9340.15	15127.37	153	Least Concern

Name	Realm	Biome	Historical Area (km²)	Current Area (km²)	Extent of Occurrence (km²)	AOO* (#10km grid cells)	Overall Status
Save Riverine Forest	Terrestrial	T1 Tropical-subtropical forests	89.56	76.16	12147.59	24	Least Concern
Save Sand Forest	Terrestrial	T1 Tropical-subtropical forests	3114.60	2755.82	49835.90	115	Least Concern
Save Valley Chalk Thicket	Terrestrial	T1 Tropical-subtropical forests	618.26	600.07	2351.60	25	Vulnerable
Songo Granite Dry Woodland	Terrestrial	T4 Savannas and grasslands	3285.69	2666.09	5926.44	61	Least Concern
Southern Inselberg Woodland	Terrestrial	T3 Shrublands & shrubby woodlands	372.99	271.21	20770.65	46	Vulnerable
Southern Lebombo Bushveld	Terrestrial	T4 Savannas and grasslands	1261.16	1122.45	3347.20	40	Least Concern
Southern Mopane Woodland	Terrestrial	T4 Savannas and grasslands	24456.27	21614.81	55766.48	420	Least Concern
Stormberg Dry Woodland	Terrestrial	T4 Savannas and grasslands	2954.04	2580.37	3754.73	47	Least Concern
Subtropical Coastal Salt Marshes	Marine-Freshwater-Terrestrial	MFT1 Brackish tidal systems	280.05	205.80	3018.94	19	Least Concern
Subtropical Seashore Vegetation	Marine-Terrestrial	MT2 Supralittoral coastal systems	88.18	62.69	27958.46	20	Least Concern
Subtropical Swamp Forest	Freshwater-Terrestrial	TF1 Palustrine wetlands	13.47	13.10	929.48	4	Vulnerable
Tembe Sandy Bushveld	Terrestrial	T4 Savannas and grasslands	5006.50	1761.79	15064.31	93	Vulnerable
Tete Gabbro Dry Woodland	Terrestrial	T4 Savannas and grasslands	5714.35	4286.98	7922.46	83	Least Concern
Tete Mixed Dry Miombo	Terrestrial	T4 Savannas and grasslands	18474.91	17041.28	47140.48	301	Least Concern
Tropical Coastal Salt Marshes	Marine-Freshwater-Terrestrial	MFT1 Brackish tidal systems	2887.82	2440.87	354741.78	238	Least Concern
Tropical Indian Ocean African Mangrove	Marine-Freshwater-Terrestrial	MFT1 Brackish tidal systems	3478.76	3165.04	441863.41	274	Least Concern
Tropical Seashore Vegetation	Marine-Terrestrial	MT2 Supralittoral coastal systems	260.44	177.00	333356.69	47	Least Concern
Tropical Swamp Forest	Freshwater-Terrestrial	TF1 Palustrine wetlands	0.60	0.47	138429.77	0	Least Concern
Ulongue Plateau Grassland	Terrestrial	T4 Savannas and grasslands	1257.11	71.38	1513.98	14	Critically Endangered
Urronga Lowland Dry Woodland	Terrestrial	T4 Savannas and grasslands	12102.14	10013.61	17811.82	170	Vulnerable
Vilanculos Coastal Miombo	Terrestrial	T4 Savannas and grasslands	3530.57	1700.05	70095.02	65	Vulnerable
Western Maputaland Clay Bushveld	Terrestrial	T4 Savannas and grasslands	3823.40	2881.63	6087.27	66	Least Concern
Zambezi Alluvial Vegetation	Terrestrial	T4 Savannas and grasslands	2171.77	1580.81	9443.81	57	Least Concern
Zambezi Chenier Dune Thicket	Marine-Terrestrial	MT2 Supralittoral coastal systems	1724.93	572.73	63734.80	85	Vulnerable
Zambezi Delta Floodplain Grassland	Terrestrial	T4 Savannas and grasslands	10569.00	8135.76	23704.18	171	Vulnerable
Zambezi Delta Lowland Forest	Terrestrial	T1 Tropical-subtropical forests	8228.95	6310.75	22802.06	141	Vulnerable
Zambezi Riverine Forest	Terrestrial	T1 Tropical-subtropical forests	358.75	312.47	112903.18	31	Least Concern
Zambezi Valley Mopane Woodland	Terrestrial	T4 Savannas and grasslands	15055.91	12076.84	55685.14	289	Least Concern
Zambezi Valley Sand Forest	Terrestrial	T1 Tropical-subtropical forests	424.98	394.35	75231.97	47	Least Concern
Zambezian Papyrus Wetland	Freshwater-Terrestrial	TF1 Palustrine wetlands	1748.17	1527.46	40413.37	62	Least Concern
Zambezian Sand Thicket	Terrestrial	T1 Tropical-subtropical forests	1205.72	1061.49	26014.26	56	Least Concern
Zumbo Montane Miombo	Terrestrial	T4 Savannas and grasslands	3814.07	2920.17	15585.27	106	Least Concern

Results per biome

The Savannas & Grasslands biome has the highest number of threatened ecosystems types (51), followed by Tropical-subtropical forests (32), with these biomes holding more than 90% of Mozambique's ecosystem types (144/162; Table 4.2). Proportionally, more than 20% of Savanna & Grassland ecosystems are Endangered or Critically Endangered, and just over 50% are threatened in total. Tropical & sub-tropical forests have a lower proportion of Critically Endangered & Endangered ecosystems, but more than 60% of ecosystems in this category are Vulnerable, reflecting widespread ecological degradation due to expansion of human activities like cropping, charcoal collection and hunting (Table 4.2; Figure 4.2).

Table 4.2 – Number of ecosystems within each IUCN RLE threat category, listed per biome.

	Threat status			
Biome	**Critically Endangered**	**Endangered**	**Vulnerable**	**Least concern**
MFT1 Brackish tidal systems				3
MT2 Supralittoral coastal systems			2	5
T1 Tropical-subtropical forests	2	2	28	12
T3 Shrublands & shrubby woodlands			1	1
T4 Savannas and grasslands	8	14	29	49
TF1 Palustrine wetlands			1	2
Total	**10**	**16**	**61**	**73**

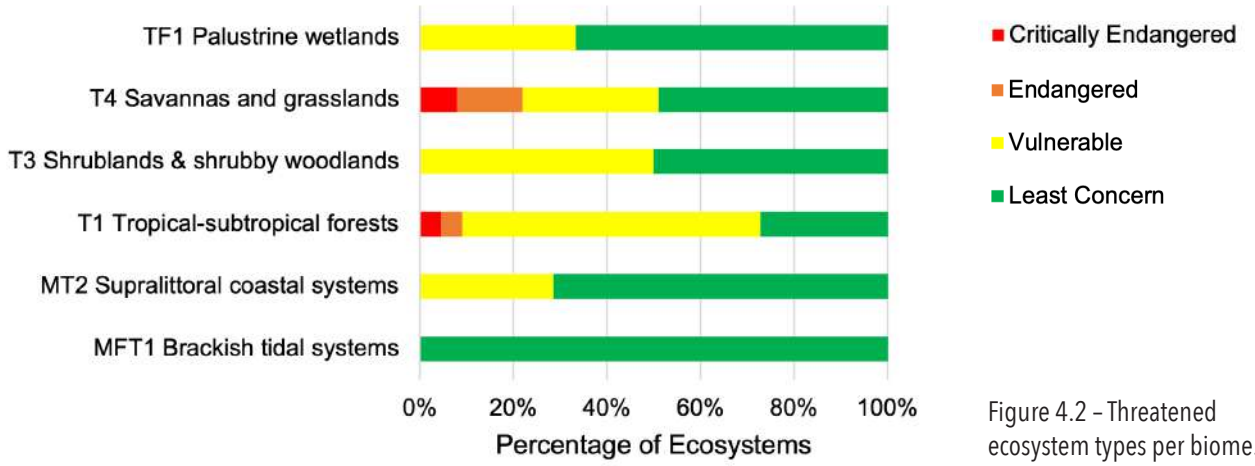


Figure 4.2 – Threatened ecosystem types per biome.

Criterion specific results

Almost all ecosystems that qualify as Critically Endangered or Endangered qualify under criterion A (reduction in geographic distribution) or criterion B (restricted geographic distribution; Table 4.3), with just 5 ecosystems qualifying as Endangered under Criterion D (abiotic degradation). While few highly threatened ecosystems were identified using Criterion D, a much larger number of Vulnerable ecosystems were identified compared to Criteria A and B (Table 4.3). This likely reflects patterns of environmental degradation across Mozambique, where large geographic areas face moderate levels of degradation, and intense degradation & habitat conversion is concentrated in smaller areas.

Table 4.3 – Criterion specific RLE results.

Status	Criterion A	Criterion B	Criterion D
Critically Endangered	6	5	0
Endangered	8	12	5
Vulnerable	11	5	60
Least Concern	135	138	89
Not Assessed	2	2	8

5 CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

This report results from four years of work by regional and national experts, under a process that was implemented in three phases that were funded by USAID through the SPEED+ program (first two phases) and AFD and FFEM, through the COMBO+ Program (third phase). The project coordinated by WCS, working in partnership with the Ministry of Land and Environment of the Government of Mozambique, and several other national institutions.
The work developed under this project allowed the mapping of 162 ecosystem types, which are distributed by the following realms: Terrestrial with 146 ecosystems (90.1%), Freshwater-Terrestrial with 3 ecosystems (1.9%), Marine-Terrestrial with 7 ecosystems (4.3%), Freshwater with 2 ecosystems (1.2%), Freshwater-Marine with 2 ecosystem (0.6%), and Marine-Freshwater-Terrestrial with 3 ecosystems (1.9%)

The vegetation types in Mozambique are complex and do not always follow predictable environmental gradients. Biogeography and historic climatic and vegetation patterns have shaped what we see today. Unfortunately, these are also hard-working landscapes shaped by man over the last few hundred years that obscures some of this pattern. Trying to reconstruct the composition of vegetation communities was challenging and the availability of fine-scaled environmental GIS dataset certainly did assist, but the human dimension and expert assessment was important in trying to decipher the spatial pattern and communities. Given the complexities, we hope that this work represents a good foundation to increase dialog and collaboration to improve upon what is presented. The authors have a lot of conviction that the map is a big improvement upon what was previously available but recognise that it is not without its flaws.

The RLE process for Mozambique revealed widespread historical loss of natural areas, resulting in a substantial proportion of Mozambique's ecosystems being threatened. Further, as we were unable to assess all RLE criteria due to a lack of suitable data, the threat status of many ecosystems is likely underestimated. Based on the RLE results it can be concluded that the vast majority of Mozambique's coastal belt has been heavily impacted by human activity. These results highlight the urgent need for improvements in ecosystem focused conservation efforts in Mozambique, primarily in the form of retention targets to curtail further loss, combined with restoration and protection to increase the extent and integrity of threatened ecosystems and improve the condition of degraded areas.

The map and report should be analysed by the National Coordination Group for KBAs and Red Lists and, once approved it should be taken to formal endorsement by the Ministry of Land and Environment as the country's official map and RLE assessment. To guarantee its validation as a formal RLE product it should also be submitted to the IUCN.

Once finalized, this map and RLE assessment will become a very useful tool for national planning initiatives at the different levels (national, provincial, district or local), whether these are related to development programs/projects or to conservation planning. This includes the National Territorial Development Plan, Provincial Territorial Development Plans, District Land Use Plans, Special Land Use Plans, Strategic Environmental Assessments, Environmental Impact Assessments, expansion of the national network of conservation areas and identification and mapping of KBAs. This product will become a corner stone for the review of the National Biodiversity Strategy and Action Plan, specifically to adjust the national conservation targets to the new CBD Global Biodiversity Framework for 2020-2030.

5.2 Major recommendations

Due to a lack of sufficient information about the vegetation of a few of Mozambique's terrestrial ecosystems, the process of improving the map that represents the original vegetation extent in Mozambique proved to be very difficult for certain vegetation units, which also made it difficult to carry out a reliable red list assessment and the validation of these products. In this section we provide specific recommendations to fill key knowledge gaps to allow for a continuous improvement of the map of the original vegetation extent and its respective units, as well as a reassessment of Mozambique's ecosystems in the future, and actions that should be addressed to avoid their collapse.

5.2.1 Continued improvement to the vegetation units and ecosystems typology

We recommend that a process be put in place to ensure the revision and updating of the ecosystem map over time as new information becomes available. This may include changes to vegetation concepts, mapping accuracy, vegetation description, and English and Portuguese names.

5.2.2 Improvements in understanding ecosystems

In order to gain a better understanding of the accuracy of the methodology and to increase our understanding of the distributions of each ecosystem type in Mozambique, it is highly recommended to conduct ground truthing, especially for those ecosystems at imminent risk of collapse, or with extremely limited knowledge of their distribution, characteristic biodiversity and status.

5.2.3 Reassess the Red List of ecosystems

This assessment is the first of its kind carried out in Mozambique, and we were unable to assess ecosystems against all RLE criteria, primarily due to data availability. As such, building on this initial assessment to address more criteria will be crucial to have an accurate understanding of the status of Mozambique's ecosystems. It is unlikely that further national-scale data will become available to allow assessment of Criterion C & E (which were not assessed here), but there is great potential for detailed assessments of ecosystems using better data specific to that ecosystem. Furthermore, because ecosystems are dynamic, and data sets on both ecosystem distribution and degradation will be constantly updated over time, we recommend periodic re-assessment of the red list of threatened ecosystems in Mozambique each 5 years, 10 at the most.

5.2.4 Use of the Biodiversity Information System for Mozambique (SIBMOZ) as a central database of ecosystem data

One of the challenges of this assessment was the fact that the information was dispersed in the various institutions and platforms. In 2022, Mozambique gave a big step in resolving this problem by launching its official Biodiversity webportal, SIBMOZ, which is a central database that concentrates all relevant information on biodiversity. It is hosted the Ministry of Land and Environment (MTA) and corresponds to the national clearinghouse mechanism under the Convention of Biological Diversity. It concentrates several relevant data sets, including spatial data. The webportal includes a specific section for ecosystems and another for the RLE, where the database of the 162 ecosystems is made available. SIBMOZ also includes different webgis, including one specific for the current product: ecosystem map and RLE. This webportal allows increasing the efficiency of conducting assessments of this kind and support the compilation of species inventories for each ecosystem identified in this assessment. The update of the database and webgis of ecosystems is essential to support future re-assessments.

5.2.5 Regional Red List of Ecosystems assessment

Considering the similar work developed in South Africa and the results of this assessment, it is likely that ecosystems in neighboring countries (South Africa, Eswatini, Zimbabwe, Malawi and Tanzania) and others in the South African Development Community (SADC) (e.g. Angola) are likely facing the same threats that cause ecosystem loss and degradation. Based on this assumption, we recommend a regional IUCN Red List of Ecosystems assessment process for SADC or at least some of the counties within in order to have a more global perspective of ecosystems and their status, using as reference the typology developed during this project and an effort to crosswalk existing typologies in surrounding countries. In 2022 a project called Spatial Biodiversity Assessment Prioritization and Planning (SBAPP) in South Africa, Namibia, Mozambique and Malawi. The SBAPP Project aims to develop and/or enhance national spatial biodiversity assessments, prioritization and planning processes and products in four Southern African countries in order to strengthen the national knowledge base on biodiversity; and ensure this knowledge informs land use planning and decision making, assists with the development of environmental policy and strategies, and provides a basis for future biodiversity monitoring. This could be a first step in promoting regional assessments.

5.2.6 Develop a marine and a freshwater red list of ecosystems of Mozambique

In addition to terrestrial ecosystems, we also recommend a comprehensive assessment of Mozambique's marine and freshwater ecosystems. A first marine ecosystem mapping was developed for Mozambique (Jones et al. 2021) and there are also regional mapping initiatives

underway (e.g. coral reefs and benthic habitats). This will require gathering resources and joint efforts to improve mapping of the original extent of these specific ecosystems. A complete assessment of these ecosystems will provide a more comprehensive view on the risk of ecosystem collapse, will be very useful in natural resource management, can be used to inform spatial planning exercises, such as the Marine Spatial Planning that was developed for Mozambique, the "situation and allocation" plans under the national legislation, as well as systematic conservation planning exercises, allowing for example to identify priority areas to establish Marine Protected Areas.

5.2.7 Integrate ecosystems within policy and planning

It is recommended to integrate the products presented here into national legislation and policy. For example, this map and assessment should inform the development of the update of the National Biodiversity Strategy and Action Plan (NBSAPs) to align it with the new Global Biodiversity Framework for the period 2020-2023 under the Convention on Biological Diversity (CBD) and or species / ecosystems strategies and action plans. We also recommend that the outputs presented here are effectively adopted by government and other stakeholders in their planning and monitoring exercises, such and the National Territorial Development Plan, the Provincial Territorial Development Plans, the District Land Use Plans and any Special Spatial Plans according to the national legislation. The map and red list assessment resulting from this report should also inform the identification of KBAs and the expansion of the National Network of Protected Areas. The SBAPP project explained above will support the Government of Mozambique on progressing towards building biodiversity knowledge for action in the country.

5.2.8 Key regions to target for conservation action

During the assessment, 22 units were identified that, given their current status (high risk of collapse CR or EN), require urgent action to ensure their persistence over time. For those areas in particular, we recommend that they should be prioritized in the implementation of conservation action plans and restoration activities, as well as in national spatial planning processes as avoidance areas for development. These should also be prioritized as potential areas for receiving biodiversity offsets.

5.2.9 Apply the red list of ecosystems in the KBAs assessment

A first national KBA assessment was recently completed in Mozambique but it was not possible to use the criteria associated to ecosystems as a detailed map and RLE did not exist. During this assessment some threatened and rare ecosystems with extremely restricted distribution were identified. It is therefore recommended to use this information in the assessment of new Key Biodiversity Areas - KBAs (Global Standard 2016), either to identify new KBAs, or to update existing ones.

Considering ecosystems in KBA identification will help to integrate priority ecosystems into the decision-making process, as KBAs have become an increasingly influential tool in the Mozambican legal framework, and in spatial planning exercises.

5.3 Main gaps

The two main parts of this project included producing a historical map of ecosystems, and then, assessing their conservation status using the IUCN Red List of Ecosystems. Both aspects of the project faced difficulties because of limited data availability, which are outlined below:

- There is limited work on the ground, particularly on accurately documenting distribution of ecosystems to ensure improved mapping and better understanding of their recent extent changes.
- For criterion A, we only applied A3 based on historical versus current distributions, as well as A2 for a small number of climate sensitive ecosystems. Further priority work could improve on this by exploring a time series of change over the past 15-20 years, and extrapolating this to 50 years to apply criterion A2 to a broader range of ecosystems.
- Experts noted some ecosystems & regions of Mozambique which are suspected to be degraded & potentially threatened, but which were assigned as Least Concern based on our existing assessment. This is likely because there was no adequate information available to assess criteria such as C and E. Further research on biotic degradation of ecosystems would be useful for addressing criterion C data gaps, while criterion E could be assessed individually for specific ecosystems that are very well understood & for which processes and interactions are well known.
- Forest data inventory was key in assisting delineating boundaries of units however, it showed several inconsistencies with respect to species identification.

- Because of the pandemic (covid-19), part of the discussions or consultations among experts were carried out via online. With limited internet access particularly for Mozambican institutions, it was very difficult to work under this circumstance.

5.4 Next steps

An assessment of the threat status of Mozambique's ecosystems based on criteria and categories of the IUCN's Red List aims to provide a useful basis for decision making across wide range of fields including conservation. Based on the conclusions, gaps and recommendations presented above, this section outlines the next steps to be undertaken towards improving the current products, including the historical map of ecosystems and the Red List of ecosystems.

In the short-term, these steps include:

- Provide the National Coordination Group for KBAs and Red Listing with the finalized map of ecosystems and results of the RLE and make any adjustments resulting from the NCG recommendations.
- Provide DINAB with the finalized map of ecosystems and RLE so that these can be assessed by the Technical and Consultive Councils of MTA.
- Organize a broad stakeholder meeting to share the map and the red list assessment at a national level.
- Submit the report to IUCN for formal validation of the red list assessments.
- Get the final endorsement of the products by the Government and share the products widely.

In the medium term, the following activities should be implemented:

- Develop fieldwork to do ground truthing in areas for which the information is scarce and improve the map based on those findings.
- Identify new Key Biodiversity Areas based on the new map and RLE.
- Calculate the protection status of ecosystems
- Run spatial prioritization exercise for action implementation within ecosystems. This is an important step to be undertaken as soon as the map of historical ecosystems has been formally accepted and regarded as an official document.
- Expand the Red List of ecosystems assessment to a regional level, which will imply standardizing the classification for the different countries in the region.

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7 APPENDIXES

7.1 Appendix 1. Complete list of contributors

#	Name	Institution
1	Mervyn Lotter	Independent consultant
2	John Burrows	Buffelskloof Nature Reserve and Herbarium
3	Warren McCleland	Independent consultant
4	Marc Stalmans	Gorongosa National Park
5	Ernst Schmidt	TBD
6	Iain Darbyshire	KEW
7	Sophie Richards	KEW
8	James Lee Tsakalos	University of Camerino, Italy
9	Hedley Grantham	WCS
10	Kendall Jones	WCS
11	Jonathan Timberlake	Independent consultant
12	Laco Mucina	TBD
13	Tony De Castro	TBD
14	Hugo Costa	WCS Mozambique
15	Hermenegildo Matimele	National Herbarium of Mozambique / National Agricultural Research Institute (IIAM)
16	Eleutério Duarte	WCS Mozambique
17	Natasha Ribeiro	Faculty of Agronomy and Forest Engineer of Eduardo Mondlane University
18	Muri Soares	National Sustainable Development Fund (FNDS)
19	Paula Santana Afonso	National Institute of Fisheries Research (IIP)
20	Célia Macamo	Department of Biological Sciences, University Eduardo Mondlane
21	Denise Nicolau	BIOFUND
22	Camila de Sousa	National Agricultural Research Institute (IIAM)
23	Teresa Alves	National Agricultural Research Institute (IIAM)
24	Silvio Cianciullo	SECOSUD II
25	Naseeba Sidat	WCS Mozambique
26	Regina Cruz	National Sustainable Development Fund (FNDS) REDD+
27	Roberto Zolho	National Sustainable Development Fund (FNDS)
28	Augusto Tembe	National Administration of Conservation Areas (ANAC)
29	Salomão Bandeira	Department of Biological Sciences, University Eduardo Mondlane
30	Alice Massingue	Department of Biological Sciences, University Eduardo Mondlane

7.2 Appendix 2. Main Technical workshops participants

#	Name	Institution	First meeting to discuss the approach for improving the Historic Vegetation Map and undertaking the Red Listing of Ecosystems **19-April-19**	Working Group technical meeting to discuss the preliminary vegetation map produced and to agree on the degradation map to be used in the Red List assessment. **11-Nov-19**	Technical Workshop to present and review the draft of vegetation map with the broader stakeholders. **22-Jan-2021**	Technical webinar with national experts, to present the updated version of the Mozambique's terrestrial ecosystem map. **5-May-2022**	Technical webinar to present the first results of the IUCN RLE assessment. **15-Nov-2022**
1	Acacio Chechene	BIOFUND					x
2	Alice Massingue	UEM			x	x	x
3	Ana Gladys Conceição	ANAC					x
4	Antonio Serra	WWF			x		
5	Augusto Tembe	ANAC			x	x	x
6	Badru Hagy	InOM (former IIP)			x		
7	Camila de Sousa	IIAM	x	x	x	x	x
8	Carina Tanques	WCS					x
9	Carmen Luisa Baptista	DINAF					x

#	Name	Institution	First meeting to discuss the approach for improving the Historic Vegetation Map and undertaking the Red Listing of Ecosystems **19-April-19**	Working Group technical meeting to discuss the preliminary vegetation map produced and to agree on the degradation map to be used in the Red List assessment.**11-Nov-19**	Technical Workshop to present and review the draft of vegetation map with the broader stakeholders. **22-Jan-2021**	Technical webinar with national experts, to present the updated version of the Mozambique's terrestrial ecosystem map. **5-May-2022**	Technical webinar to present the first results of the IUCN RLE assessment. **15-Nov-2022**
10	Carolina Policarpo	FNDS-MOZBIO			x	x	
11	Célia Macamo	UEM		x	x	x	x
12	Celso Montanha	InOM (former IIP)			x		
13	Denise Nicolau	BIOFUND			x	x	x
14	Edna Mujovo	SECOSUD II	x				
15	Eleutério Duarte	WCS Mozambique	x	x	x	x	x
16	Focas Bacar	TBD					x
17	Hedley Grantham	WCS	x	x			
18	Hercilo Odorico	FNDS	x				
19	Hermenegildo Matimele	IIAM	x	x	x	x	
20	Hugo Costa	WCS Mozambique	x	x	x	x	x
21	Hugo Mabilana	UEM			x		
22	Isabel Matsinhe	SPEED+ Program			x		
23	Isabel Ramos	IUCN			x		x
24	Ivan Nerantzoulis	WCS				x	x
25	João Fernando	USAID			x		
26	Joaquim Campira	SECOSUD II	x				
27	Joaquim Macuacua	DINAF			x		
28	John Burrows	Buffelskloof Nature Reserve & Herbarium			x		
29	Jonathan Timberlake	Independent consultant			x		
30	Jorge Sitoe	WCS Mozambique	x				
31	José Jerónimo	IMPACTO			x		
32	Kendall Jones	WCS	x	x		x	x
33	Marc Stalmans	Gorongosa National Park			x		x
34	Maria Julieta Martinho	IUCN			x		x
35	Mauricio Xerinda	IUCN			x		
36	Mervyn Lotter	Independent consultant	x	x	x	x	x
37	Muaule Chuluma	WCS					x
38	Muri Soares	FNDS		x	x	x	x
39	Naseeba Sidat	WCS Mozambique	x	x	x		
40	Natasha Ribeiro	UEM		x			
41	Pachis Mugas	DINAF			x		
42	Paula Santana Afonso	InOM (former IIP)		x	x		
43	Regina Cruz	FNDS		x	x		x
44	Roberto Zolho	FNDS		x	x		x
45	Salomão Bandeira	UEM			x	x	x
46	Sean Nazerali	BIOFUND		x			
47	Silvio Cianciullo	SECOSUD II			x	x	x
48	Simon Pires	Impacto Lda					x
49	Sofia Chambe	DNDT			x		
50	Teresa Alves	IIAM	x	x		x	x

7.3 Appendix 3. Translation of Ecosystem Names: English to Portuguese

Code	Current English Name	Proposed Portuguese Name
ACF1	Maputaland Dune Forest	Floresta das dunas de Maputaland
ACF2	Inhambane Dune Thicket	Brenha das dunas de Inhambane
ACF3	Zambezi Chenier Dune Thicket	Brenha das dunas frontais da foz do Zambeze
ACF4	Rovuma Dune Thicket	Brenha das dunas do Rovuma
ACF5	Rovuma Coral Rag Thicket	Brenha sob destroços de coral do Rovuma
AMAN1	Tropical Indian Ocean African Mangrove	Mangal do Índico Ocidental
ARF1	Limpopo-Olifants Riverine Forest	Floresta ribeirinha do Limpopo-Elefantes
ARF2	Maputo Riverine Forest	Floresta ribeirinnha de Maputo
ARF3	Save Riverine Forest	Floresta ribeirinnha do Save
ARF4	Rovuma Riverine Forest	Floresta ribeirinha do Rovuma
ARF5	Lurio Riverine Forest	Floresta ribeirinha do Lúrio
ARF6	Zambezi Riverine Forest	Floresta ribeirinha do Zambeze
ASVs1	Maputo Alluvial Vegetation	Vegetação aluvial de Maputo
ASVs2	Save Alluvial Vegetation	Vegetação aluvial do Save
ASVt1	Buzi-Pungwe Alluvial Vegetation	Vegetação aluvial de Buzi-Pungue
ASVt2	Rift Valley Floodplain Wooded Grassland	Pradaria arbórea da planicie de inundação do vale do Rift
ASVt3	Rovuma Alluvial Vegetation	Vegetação aluvial do Rovuma
ASVt4	Zambezi Alluvial Vegetation	Vegetação aluvial do Zambeze
ASVt5	Zambezi Delta Floodplain Grassland	Pradaria de inundação do Delta do Zambeze
ASwF1	Subtropical Swamp Forest	Floresta pantanosa subtropical
ASwF2	Tropical Swamp Forest	Floresta pantanosa Tropical
ATF1	Central Montane Forest	Floresta montana do centro
ATF2	Central Submontane Forest	Floresta submontana do centro
ATF3	Northern Montane Forest	Floresta montana do norte
ATF4	Northern Submontane Forest	Floresta submontana do norte
AzC1	Subtropical Seashore Vegetation	Vegetação da orla marítima subtropical
AzC2	Tropical Seashore Vegetation	Vegetação da orla marítima tropical
AzE1	Subtropical Coastal Salt Marshes	Sapais subtropicais
AzE3	Tropical Coastal Salt Marshes	Sapais tropicais
AzL1	Coastal Lagoons	Lagoas costeiras
AzS1	Banhine Inland Salt Pans	Depressão salgada do interior de Banhine
AzW4	Zambezian Papyrus Wetland	Terras húmidas de papiro do Zambeze
FWL1	Freshwater Lake	Lago de água doce
Ge1	Chimanimani Montane Grassland	Pradaria de montanha de Chimanimani
Ge2	Gorongosa Montane Grassland	Pradaria de montanha da Gorongosa
Ge3	Manica Montane Grassland	Pradaria de montanha de Manica
Gn1	Chitonga Montane Wooded Grassland	Pradaria arbórea de montanha de Chitonga
Gn2	Lichinga Wooded Grassland	Pradaria arbórea de Lichinga
Gn3	Mecula Summit Grassland	Pradaria do Cume de Mecula
Gn4	Namuli Montane Grassland	Pradaria de Montanha do Namuli
Gn5	Ulongue Plateau Grassland	Pradaria do planalto de Ulongué
STF1	Maputaland Coastal Forest	Floresta costeira de Maputaland
STF10	Lebombo-KwaZulu Natal Scarp Forest	Floresta da escarpa Lebombo-KwaZulu Natal
STF2	Bilene Coastal Forest	Floresta costeira do Bilene
STF3	Cheringoma Limestone Gorge Forest	Floresta do desfiladeiro calcárico de Cheringoma
STF4	Central Lowland Moist Forest	Floresta húmida das terras baixas do centro
STF5	Northern Lowland Moist Forest	Floresta húmida das terras baixas do norte
STF6	Amatonga Lowland Semideciduous Forest	Floresta semidecidua das terras baixas de Amatonga
STF7	Zambezi Delta Lowland Forest	Floresta das terras baixas do Delta do Zambeze
STF8	Central Mid-elevation Moist Forest	Floresta húmida de media altitude do centro
STF9	Northern Mid-elevation Moist Forest	Floresta húmida de media altitude do norte
SVcs1	Maputaland Coastal Wooded Grassland	Pradaria arbórea costeira de Maputaland
SVct1	Cheringoma Coastal Palm Savanna	Pradaria arbórea de palmar de Cheringoma

Code	Current English Name	Proposed Portuguese Name
SVct2	Inharrime Coastal Palm Savanna	Pradaria arbórea de palmar de Inharrime
SVct3	Nampula Coastal Palm Savanna	Pradaria arbórea costeira de palmar de Nampula
SVct4	Rovuma Coastal Wooded Grassland	Pradaria arbórea costeira do Rovuma
SVct5	Save Coastal Palm Savanna	Pradaria arbórea costeira de palmar do Save
SVin1	Northern Inselberg Woodland	Mata dos Inselberg do norte
SVin2	Southern Inselberg Woodland	Mata dos Inselberg do sul
SVmd1	Angonia Gneiss Montane Miombo	Miombo de montanha gneissica de Angónia
SVmd10	Save Coastal Miombo	Miombo costeiro do Save
SVmd11	Tete Mixed Dry Miombo	Mata seca indiferenciada de Tete
SVmd12	Vilanculos Coastal Miombo	Miombo costeiro de Vilanculos
SVmd2	Barue Escarpment Miombo	Miombo da escarpa de Báruè
SVmd3	Inhambane Coastal Miombo	Miombo costeiro de Inhambane
SVmd4	Lugenda Lowland Dry Miombo	Miombo seco das terras baixas de Lugenda
SVmd5	Lurio Valley Dry Miombo	Miombo seco do vale do Lúrio
SVmd6	Maravia Plateau Miombo	Miombo do Planalto de Maravia
SVmd7	Memba Dry Miombo	Miombo seco de Memba
SVmd8	Mueda Mixed Dry Miombo	Miombo seco de Mueda
SVmd9	Pangue Dry Miombo	Miombo seco de Pangue
SVmw1	Amaramba Moist Miombo	Miombo húmido de Amaramba
SVmw10	Choa Escarpment Moist Miombo	Miombo humido da escarpa de Choa
SVmw11	Coastal Berlinia Miombo	Miombo costeiro de Berlinia
SVmw12	Dombe Escarpment Miombo	Miombo da escarpa de Dombe
SVmw13	Gorongosa Escarpment Moist Miombo	Miombo humido da escarpa da Gorongosa
SVmw14	Gorongosa Foothills Moist Miombo	Miombo húmido do sopé da Gorongosa
SVmw15	Gurue Plateau Moist Miombo	Miombo húmido do planalto de Gurue
SVmw16	Lake Niassa Lowland Miombo	Miombo das terras baixas do Lago Niassa
SVmw17	Lichinga Escarpment Moist Miombo	Miombo húmido da escarpa de Lichinga
SVmw18	Lichinga Montane Moist Miombo	Miombo húmido de montanha de Lichinga
SVmw19	Lupilichi Escarpment Miombo	Miombo da escarpa de Lupilichi
SVmw2	Angonia Escarpment Miombo	Miombo da escarapa de Angónia
SVmw20	Mabu Moist Miombo	Miombo húmido de Mabu
SVmw21	Macanga Montane Moist Miombo	Miombo húmido de montanha de Macanga
SVmw22	Malema Granite Escarpment Miombo	Miombo da escarpa granítica de Malema
SVmw23	Manda Moist Miombo	Miombo húmido de Manda
SVmw24	Marrupa Plateau Moist Miombo	Miombo húmido do Planalto de Marrupa
SVmw25	Matondonvela Moist Miombo	Miombo húmido de Matondonvela
SVmw26	Mocuba Moist Miombo	Miombo húmido de Mocuba
SVmw27	Montepuez Plateau Moist Miombo	Miombo húmido do Planalto de Montepuez
SVmw28	Morrumbala Lowland Moist Miombo	Miombo húmido das terras baixas de Morrumbala
SVmw29	Morrumbala Plateau Moist Miombo	Miombo húmido do Planalto de Morrumbala
SVmw3	Angonia Montane Moist Miombo	Miombo húmido de montanha de Angónia
SVmw30	Mossurize Escarpment Miombo	Miombo da escarpa de Mossurize
SVmw31	Mueda Escarpment Miombo	Miombo da escarpa de Mueda
SVmw32	Nametil Moist Miombo	Miombo húmido de Nametil
SVmw33	Nampula Granite Escarpment Miombo	Miombo da escarpa granítica de Nampula
SVmw34	Nungo Moist Miombo	Miombo húmido de Nungo
SVmw35	Pebane Sandy Shrub Miombo	Miombo arbustivo arenoso de Pebane
SVmw36	Ribaue Granite Escarpment Miombo	Miombo da escarpa granítica do Ribáuè
SVmw37	Rovuma Coastal Moist Miombo	Miombo húmido costeiro do Rovuma
SVmw38	Zumbo Montane Miombo	Miombo de Montana do Zumbo
SVmw4	Barue Plateau Moist Miombo	Miombo húmido do planalto de Bárué
SVmw5	Cheringoma Coastal Moist Miombo	Miombo húmido costeiro de Cheringoma
SVmw6	Cheringoma Escarpment Moist Miombo	Miombo húmido da escarpa de Cheringoma
SVmw7	Cheringoma Plateau Moist Miombo	Miombo húmido do planalto de Cheringoma
SVmw8	Chimanimani Montane Miombo	Miombo de Montana de Chimanimani

Code	Current English Name	Proposed Portuguese Name
SVmw9	Chimoio Moist Miombo	Miombo húmido do Chimioio
SVmwl1	Limpopo Ridge Mopane Woodland	Mata de Mopane da Cordilheira do Limpopo
SVmwl2	Southern Mopane Woodland	Mata de mopane do sul
SVmwz1	Luia Basalt Mopane Woodland	Mata de mopane sob basalto de Lula
SVmwz2	Mágoè Sandstone Mopane Woodland	Mata de mopane em arenito de Magoé
SVmwz3	Zambezi Valley Mopane Woodland	Mata de mopane do Vale do Zambeze
SVsl1	Gaza Sandy Guibourtia Woodland	Mata arenosa de Chacate de Gaza
SVsl2	Lebombo Summit Sourveld	Pradaria do cume dos Libombos
SVsl3	Northern Lebombo Bushveld	Pradaria arbustiva do norte dos Libombos
SVsl4	Southern Lebombo Bushveld	Pradaria arbustiva do sul dos Libombos
SVsl5	Limpopo Lowland Woodland	Mata das terras baixas do Limpopo
SVsl6	Nwambiya-Pumbe Sandy Bushveld	Pradaria arbustiva arenosa de Nwambyla-Pumbe
SVsl7	Tembe Sandy Bushveld	Pradaria arbustiva arenosa do Tembe
SVsl8	Urronga Lowland Dry Woodland	Mata seca das terras baixas do Urronga
SVsl9	Western Maputaland Clay Bushveld	Pradaria arbustiva em argila do oeste de Maputaland
SVss1	Mecufi Sandstone Dry Woodland	Mata seca no arenito de Mecúfi
SVss2	Northern Coastal Dry Woodland	Mata costeira seca do norte
SVsz1	Bangomatete Rhyolite Dry Woodland	Mata seca de riolito de Bangomatete
SVsz10	Save Lowland Dry Woodland	Mata seca das terras baixas do Save
SVsz11	Songo Granite Dry Woodland	Mata seca em granito do Songo
SVsz12	Stormberg Dry Woodland	Pradaria arbustiva do sul dos Libombos
SVsz13	Tete Gabbro Dry Woodland	Mata seca em rochas de gabro de Tete
SVsz2	Canxixe Lowland Dry Woodland	Mata seca das terras baixas de Canxixe
SVsz3	Dombe Basalt Dry Woodland	Mata seca do basalto de Dombe
SVsz4	Guro Dry Woodland	Mata seca de Guro
SVsz5	Lupata Plateau Dry Woodland	Mata seca do planalto de Lupata
SVsz6	Madanda Sandstone Dry Woodland	Mata seca em arenito de Madanda
SVsz7	Maringue Sandstone Dry Woodland	Mata seca em arenito de Maringue
SVsz8	Monapo Klippe Dry Woodland	Mata seca dos rochedos de Monapo
SVsz9	Rift Valley Lowland Woodland	Mata das terras baixas do vale do Rift
TDFE1	Icuria Coastal Forest	Floresta Costeira de Icuria
TDFE2	Nampula Ironwood Forest	Floresta de mecrusse de Nampula
TDFE3	Macomia Lowland Deciduous Forest	Floresta decídua das terras baixas de Macomia
TDFE4	Memba Dry Deciduous Lowland Forest	Floresta seca das terras baixas de Memba
TDFE5	Mueda Midslope Deciduous Forest	Floresta decidua de média altitude de Mueda
TDFE6	Mueda Plateau Moist Forest	Floresta húmida do planalto de Mueda
TDFE7	Nangade Deciduous Newtonia Forest	Floresta seca de Newtonia de Nangade
TDFE8	Northern Inselberg Forest	Florestas de Inselberg das terras baixas do Norte
TDFE9	Rovuma Basin Coastal Forest	Floresta Costeira da Bacia do Rovuma
TDFS1	Inhamitanga Sand Forest	Floresta arenosa de Inhamitanga
TDFS2	Ironwood Dry Forest	Floresta seca de Mecrusse
TDFS3	Madanda Sand Forest	Floresta arenosa de Madanda
TDFS4	Maputaland Sand Forest	Floresta arenosa de Maputaland
TDFS5	Save Sand Forest	Floresta arenosa do Save
TDFS6	Zambezi Valley Sand Forest	Floresta arenosa do vale do Zambeze
TDT1	Licuati Sand Thicket	Brenha arenosa do Licuáti
TDT2	Madanda Rubber Sand Thicket	Brenha arenosa de De Madanda
TDT3	Makonde Bamboo Thicket	Brenha de bamboo de Makonde
TDT4	Mazoe Gneiss Dry Thicket	Brenha em gneiss jess de Mazoé
TDT5	Mueda Dry Sand Thicket	Brenha seca arenosa de Mueda
TDT6	Nwambiya Sand Thicket	Brenha arenosa de Nwambiya
TDT7	Pande Sand Thicket	Brenha arenosa de Pande
TDT8	Save Valley Chalk Thicket	Brenha em calcário do val do Save
TDT9	Zambezian Sand Thicket	Brenha arenosa do Zambeze

7.4 Appendix 4. The spatial climate diagrams of the biomes

Sources and processing of the climatic data

We constructed the climatic profiles of the biomes using modelled climatologies at high resolution for the earth's land surface areas (CHELSA version 1.2; see Karger et al. 2017; Beck et al. 2020) and WorldClim version 2 (Fick & Hijmans, 2017) both at a 30 arc-second scale (~1 km, 0.00833 degrees) and Mapzen's digital elevation product (Hollister, 2021). We sourced Mapzen's digital elevation data freely through Amazon Web Services using the 'get_elev_raster' function from R's elevatr package (Hollister, 2021). We accessed and downloaded the CHELSA and WorldClim data using the 'CHELSA climate' and 'WorldClim Version 2' internet portals.

Mapzen's product is unique in that it combines several sources of digital elevation models, including SRTM, the ArcticDEM (covering all areas north of 60°; Mortin et al., 2016), EUDEM (digital elevation model over Europe; for review, see Mouratidis & Ampatzidis, 2019), and others into a single product. We supplied the Vegetation map, imported into R using terra's 'vect' function, as the 'locations' argument in the 'get_elev_raster' function. Also, within the 'get_elev_raster' function, we specified the 'zoom' (i.e., resolution of the resultant raster) argument as 8, corresponding to 305.7 m ground resolution at 60° latitude 432.4 m at 45° and 611.5 m at 0°.

We used the CHELSA data (mean monthly mean, minimum and maximum temperature monthly temperature) because of its high accuracy in its temperature prediction over South Africa compared to other products (e.g. ERA-Interim: Dee et al. 2011; CRU: Harris et al. 2014; CHIRPS: Funk et al. 2015, see: Karger et al. 2017a, 2017b). We opted to use WorldClim's precipitation because a preliminary inspection of CHELSA's values for Chitonga Montane Wooded Grassland rainfall and other vegetation units revealed values higher than our expectations (Figure 7.1).

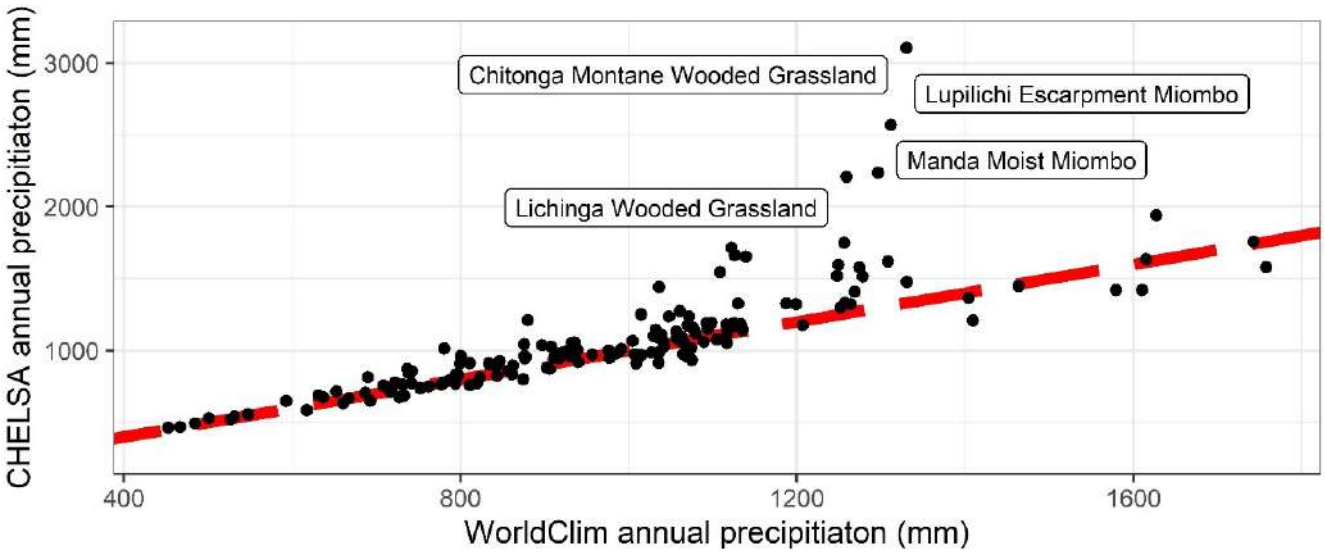

Figure 7.1 – Graphical explanation of the difference between the annual precipitation values derived from CHELSA version 1.2 and WorldClim version 2 for each vegtation type. Red dotted line represents a 1:1 relationship between the X and Y axes; values falling further from the line may be overestimated by CHELSA's precipitation modelling routine.

We used R (R Core Team 2021) and several contributed packages to link the new mapping product with the modelled climate surfaces and elevation data with the following four general steps:

Step 1. Import and stack the monthly raster datasets for the mean monthly mean, minimum and maximum temperature and precipitation using the terra (Hijmans 2022) R package's 'rast' function. In the case of the elevation data, no stacking was required.
Step 2. Reproject the mapping product onto the coordinate reference system of the rasters using terra's 'project' function.
Step 3. Convert the mapping product from a vector shapefile into a raster product with zones that match the desired vegetation type using terra's 'rasterize' function.
Step 4. Calculate the zonal statistics, that is, summarized values of a new raster for each zone using terra's 'zonal' function.

Several variables (including mean annual temperature, isothermality, temperature seasonality, mean annual precipitation, and precipitation seasonality) presented in the climate diagrams correspond to Nix's (1986) commonly used bioclimatic variables (see also Busby, 1991). These variables, and others (totalling 19), have become colloquiality referred to as 'bioclim' variables/ Critically, these variables are supposed to represent features of climate that are physiologically relevant to plant growth and species distribution (Title and Bemmels, 2018). To promote transparency in their calculation, we opted to calculate these variables using the extracted climatic data (see Steps 1–4 described above) by following Bede-Fazekas and Somodi's (2020) dynamic R code. Several automated approaches exist in R. However, their calculations are less transparent and may vary (e.g. Hijmans et al.'s 2021 dismo package and the associated 'biovars' function). In addition to these bioclimatic variables, we used base R coding to calculate Holdrige's (1966) biotemperature and potential evapotranspiration (BioT and PET, resp.) and the number of dry months (Dry mo)

Climate variables
We used the following climatic variables in the construction of the climate diagrams:

The red lines in a diagram indicate the patterns of the Mean Monthly Minimum and Mean Monthly Maximum temperatures. The blue bars depict Mean Monthly Precipitation. All data come from the CHELSA and WorldClim version 2 and represent the variables tmin_1 to tmin_12, tmax_1 to tmax_12 and prec_1 to prec_12.

BioT (Biotemperature): Biotemperature is the temperature range in which the effective growth of plants occurs. We calculated the biotemperature as the sum of all monthly temperatures greater than 0 and less than 30°C divided by 12. The values are small towards the poles, where the mean annual temperatures are low, whereas BioT is large in the tropics with the highest mean annual temperatures.

ISO (Isothermality): quantifies how large the day-to-night temperatures oscillate relative to the summer-to-winter oscillations, given in percent. The variable as presented in the climate diagrams represents 'BIO3' calculated using Bede-Fazekas and Somodi's (2020) R code. An ISO value of 100 indicates a minor temperature variability within an average month relative to the year. Across the new vegetation map, ISO ranges from 53.96 to 56.18 compared to the global range of 9.13 to 100, based on WorldClim V2.

MAT (Mean Annual Temperature): The mean temperature in °C uses the average monthly temperature averaged over twelve months. The variable presented in the climate diagrams represents 'BIO1' calculated using Bede-Fazekas and Somodi's (2020) R code. Across the new vegetation map, MAT ranges from 24.18°C to 24.47°C (the global range: −29.0°C to 32.0°C).

TS (Temperature Seasonality): Is the amount of temperature variation over a given year (or averaged years) based on the standard deviation (variation) of monthly temperature averages. The variable presented in the climate diagrams represents 'BIO4' Bede-Fazekas and Somodi's (2020) R code. Across the new vegetation map, TS ranges from 158.37 to 280.18 compared to the global range of 0 to 2364, based on WorldClim V2.
Dry Months (Dry mo): We defined the number of 'dry months' as the number of months in the year (between 0 and 12) for each vegetation type with less than 50 mm rainfall during the month.

MAP (Mean Annual Precipitation): Annual

Precipitation, given in mm. The variable presented in the climate diagrams represents 'BIO12' calculated using Bede-Fazekas and Somodi's (2020) R code. Across the new vegetation map, MAP ranges from 693 to 1134.

PET (Potential evapotranspiration ratio): The quantity of water given up to the atmosphere within a zonal climate and upon a zonal soil by the area's natural vegetation. The PET variable, taken from Holdridge (1966), was calculated as the BioT/MAT × 58.93. When the ratio is <1, rainfall exceeds potential evapotranspiration and vica versa.

PS (Precipitation Seasonality): A measure of the variation in monthly precipitation totals for the year. This index is the ratio of the standard deviation of the monthly total precipitation to the mean monthly total precipitation (also known as the coefficient of variation), expressed as a percentage. The variable as presented in the climate diagrams represents 'BIO15' calculated Bede-Fazekas and Somodi's (2020) R code. The values are higher in areas that experience extreme wet and dry periods and lower in areas with even rainfall throughout the year. Across the new vegetation map, PS ranges from 0.92 to 1.04 compared to the global range of 0 to 229, based on WorldClim V2.

S:A:W:V: These symbols represent the seasonal rainfall in four seasons, defined as (for the Southern Hemisphere): S: summer (December to February), A: autumn (March to May), W: winter (June to August); V: spring or vernal (September to November). We calculated the percent of rainfall within each of the seasons using base R coding.

Elevation (Elv): A measure of the elevation (m a.s.l) from Mapzen's terrain tile product (described above). Across the new vegetation map, Elv ranges from 0 to 2277. While the global height ranges from 0 to 8849 m.a.s.l on Mount Everest.

Lat (Latitude): We derived the latitude (decimal degrees) as the vegetation units centroid. We used terra's (Hijmans 2022) 'centroids' function to determine the y-coordinate centroid for each biome using the WGS 1984 (EPSG: 4326) coordinate system

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