



interesting and rare species within this IPA. For example, a potentially new species of *Hygrophila* was noted by Timberlake et al. (2014) from edaphic grassland at this site.

---

## Habitat and geology

This IPA contains a rich mosaic of habitats which are summarised by Timberlake et al. (2014), from which the following information is derived; however, it should be noted that much of the IPA has not yet been surveyed. Outcrops of marl and limestone from the lower Cenozoic (Tertiary) Period occur along the lower slopes of the valley. In combination with Quaternary clays, these give rise to calcareous-rich clay soils that support an *Acacia*-dominated woodland. Important species include *Acacia gerrardii*, *A. polyacantha* and *A. robusta* subsp. *usambarensis*, together with *Dalbergia melanoxylon* and *Spirostachys africana*. This habitat, rare in northeast Mozambique, also supports a number of rare species (see above) including *Acacia latispina*.

Ridges of sandstone are encountered across the landscape and these hold a mixture of miombo woodland, dominated by *Julbernardia globiflora* together with *Azelia quanzensis*, *Berlinia orientalis* and *Diplorhynchus condylocarpon*, and on deeper sands, a woodland dominated by *Hymenaea verrucosa*, *Millettia stuhlmannii* and *Terminalia* (formerly *Pteleopsis*) *myrtifolia* (Timberlake et al. 2014). Some small patches of dry forest occur within these woodlands but these are not well documented at this site.

The floodplain holds Quaternary black or greyish clays supporting an extensive wooded grassland and open grassland, which is inundated during the wet season but is frequently burnt in the dry season. The dominant tree is *Acacia seyal*, with shrubs of *Combretum* spp. and the striking Mozambican endemic shrub *Thespesia mossambicensis* being common. The dominant grasses are *Panicum coloratum* or, on patches of heavier soil, *Setaria incrassata*. River and stream channels, usually dry in the prolonged dry season, are lined by dense thickets.

The climate is characterised by a prolonged dry season from May to November/December, with a single rainy season December to April; annual rainfall is approximately 1,000 – 1,150 mm per year. The rivers and streams are mainly seasonal. Dry season fires are frequent across the floodplain.

---

## Conservation issues

Much of this IPA lies within the wilderness zone of the Quirimbas National Park and UNESCO Biosphere Reserve, although the northeast portion north of the Mucojo-Macomia road is within the Park's buffer zone. This park was established in 2002, initially with support from WWF Mozambique and French and Danish development agencies. However, active management and conservation within the park is limited due to insufficient resources, and the Muàgámula River IPA is not considered to be well protected at present. This has been exacerbated by the recent violent insurgency in Cabo Delgado Province which has resulted in large displacements of populations from north of Pemba and major

security concerns across the region. There are now serious problems with wildlife poaching and illegal timber extraction in coastal Cabo Delgado. Ecotourism, which could greatly benefit the Quirimbas wilderness zone, is not viable in the current political situation. Wood harvesting for charcoal and timber has been noted to be degrading some of the woodland habitats along the Mucojo-Macomia road, particularly targeting timber species such as *Millettia stuhlmannii*. However, extensive areas of habitat at this site remain largely intact and undisturbed.

A significant threat arose in the mid-2010s from the proposed construction of a new road from Mocimboa da Praia to Pemba associated with oil and gas industrial activity which would have run through the Muàgámula floodplain. Thankfully, this project did not proceed, and the threat appears to have abated. Current petroleum industry activity is focused on offshore liquefied natural gas (LNG) extraction further north on the Cabo Delgado coast.

The Muàgámula River IPA falls within the vast Quiterajo Key Biodiversity Area, which was designated based upon the range of threatened and range-restricted plant species in this region.

---

## Site assessor(s)

Iain Darbyshire, Royal Botanic Gardens, Kew

---

## IPA criterion A species

SPECIES	QUALIFYING SUB-CRITERION	≥ 1% OF GLOBAL POPULATION	≥ 5% OF NATIONAL POPULATION	1 OF 5 BEST SITES NATIONALLY	ENTIRE GLOBAL POPULATION	SOCIO-ECONOMICALLY IMPORTANT	ABUNDANCE AT SITE
<i>Heinsia mozambicensis</i> (Verdc.) J.E.Burrows & S.M.Burrows	A(i)	✓	✓	✓	—	—	Scarce
<i>Combretum caudatisepalum</i> Exell & J.G.García	A(i)	✓	✓	✓	—	—	Unknown
<i>Terminalia barbosae</i> (Exell) Gere & Boatwr.	A(i)	✓	✓	✓	—	—	Unknown
<i>Acacia latispina</i> J.E.Burrows & S.M.Burrows	A(i)	✓	✓	✓	—	—	Occasional
<i>Millettia makondensis</i> Harms	A(i)	✓	✓	✓	—	—	Unknown
<i>Oxyanthus strigosus</i> Bridson & J.E.Burrows	A(i)	✓	✓	✓	—	—	Unknown
<i>Premna schliebenii</i> Werderm.	A(i)	—	✓	✓	—	—	Unknown
<i>Duosperma dichotomum</i> Vollesen	A(i)	✓	✓	✓	—	—	Unknown
<i>Grewia filipes</i> Burret	A(i)	✓	✓	✓	—	—	Unknown
<i>Tarenna pembensis</i> J.E.Burrows	A(i)	✓	✓	✓	—	—	Unknown
<i>Acacia latistipulata</i> Harms	A(i)	✓	✓	✓	—	—	Scarce

## IPA criterion C qualifying habitats

HABITAT	QUALIFYING SUB-CRITERION	≥ 5% OF NATIONAL RESOURCE	≥ 10% OF NATIONAL RESOURCE	1 OF 5 BEST SITES NATIONALLY	AREAL COVERAGE AT SITE
Rovuma Coastal Dry Forest	C(iii)	—	—	—	

## General site habitats

GENERAL SITE HABITAT	PERCENT COVERAGE	IMPORTANCE
Forest - Subtropical/Tropical Dry Forest	—	Minor
Savanna - Moist Savanna	—	Major
Shrubland - Subtropical/Tropical Dry Shrubland	—	Major
Grassland - Subtropical/Tropical Seasonally Wet/Flooded Lowland Grassland	—	Major
Wetlands (inland) - Seasonal/Intermittent/Irregular Rivers, Streams, Creeks	—	Minor

## Land use types

LAND USE TYPE	PERCENT COVERAGE	IMPORTANCE
Nature conservation	—	Major
Agriculture (pastoral)	—	Minor
Tourism / Recreation	—	Minor
Harvesting of wild resources	—	Minor

## Threats

THREAT	SEVERITY	TIMING
Transportation & service corridors - Roads & railroads	High	Past, not likely to return
Biological resource use - Gathering terrestrial plants	Medium	Ongoing - trend unknown

## Protected areas

PROTECTED AREA NAME	PROTECTED AREA TYPE	RELATIONSHIP WITH IPA	AREAL OVERLAP
Quirimbas National Park	National Park	protected/conservation area overlaps with IPA	—
Quirimbas Biosphere Reserve	UNESCO Biosphere Reserve	protected/conservation area overlaps with IPA	—

## Conservation designation

DESIGNATION NAME	PROTECTED AREA	RELATIONSHIP WITH IPA	AREAL OVERLAP
Quiterajo	Key Biodiversity Area	protected/conservation area encompasses IPA	—

## Management type

MANAGEMENT TYPE	DESCRIPTION	YEAR STARTED	YEAR FINISHED
Protected Area management plan in place	Ministry of Tourism (2012). Parque Nacional das Quirimbas: Plano de Maneio 2013-22.	2013	2022

## Bibliography

Darbyshire, I., Timberlake, J., Osborne, J., Rokni, S., Matimele, H., Langa, C., Datizua, C., de Sousa, C., Alves, T., Massingue, A., Hadj-Hammou, J., Dhanda, S., Shah, T. & Wursten, B. 2019. **The endemic plants of Mozambique: diversity and conservation status.** PhytoKeys, Vol 136, page(s) 45-96

Timberlake, J., Goyder, D., Crawford, F. & Pascal, O. 2010. **Coastal Dry Forests in Cabo Delgado Province, Northern Mozambique: Botany and Conservation..**

Burrows, J.E. & Timberlake, J.R. 2011. **Mozambique's centres of endemism, with special reference to the Rovuma Centre of Endemism of NE Mozambique and SE Tanzania..** South African Journal of Botany, Vol 77, page(s) 518

Timberlake, J., Goyder, D., Crawford, F., Burrows, J.E., Clarke, G.P., Luke, Q., Matimele, H., Müller, T., Pascal, O., de Sousa, C. & Alves T. 2011. **Coastal dry forests in northern Mozambique..** Plant Ecology and Evolution, Vol 144, page(s) 126-137

Timberlake, J., Matimele, H. & Massingue, A. 2014. **Environmental assessment of proposed road alignment – Pemba to Mocimboa da Praia, northern Mozambique: plants and vegetation..**