Pomene

MOZTIPA041

Country: **Mozambique**
Administrative region: **Inhambane (Province)**
Central co-ordinates: **-22.99790 N, 35.55960 E**
Area: **74km²**

Qualifying IPA criteria

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

IPA assessment rationale

Pomene qualifies under IPA sub-criterion A(i) with two Vulnerable species: Euphorbia baylissii, Elaeodendron fruticosum and Solanum litoraneum. This site also qualifies under sub-criterion A(iv) for the range restricted endemic Salicornia mossambicensis (DD). With 11 endemic taxa recorded to-date, Pomene also qualifies under sub-criterion B(ii), falling within the top 15 sites nationally for endemic and range restricted species. While there is currently insufficient information for assessing this site under criterion C(iii), it should also be noted that Pomene hosts an extensive area of intact coastal dune habitat. Much of this habitat in southern Mozambique has been degraded through conversion to agriculture, however, the Pomene Natural Reserve has facilitated the protection of this habitat within the IPA.

Site description

The Pomene IPA falls within Massinga District of Inhambane Provence. The site is predominantly coastal and lies to the east of the Muducha River, spanning an area of 74 km2 from Guma village in the south to the estuary at Pomene Bay in the north-west and Ponta Barra Falsa (False Bar Point) to the north-east. The boundary largely follows that of Pomene National Reserve, however, the most northerly section, including the mangrove forest and lagoons west of the Muducha estuary, and the eastern boundary, following the shoreline to incorporate the intact dune habitat, of this IPA are beyond the reserve boundary.
The presence of the National Reserve at Pomene has maintained a large area of intact vegetation, particularly coastal dunes, in contrast to much of the coastline from Maputo to the Save River which has been cleared for subsistence farming (BirdLife International 2001). The site also falls within the proposed Inhambane Centre of Plant Endemism (Darbyshire et al. 2019) and there are at least 11 endemic species known from the Pomene IPA.

Botanical significance

Pomene falls within the proposed Inhamabane Centre of Plant Endemism (Darbyshire et al. 2019). A total of 11 endemic species have been recorded within this IPA. One of these endemic species, Elaeodendron fruticosum (VU), is only known from this Centre of Endemism (CoE) and has been described as common towards Pomene Bay. E. fruticosum is one of three globally threatened species recorded at this site alongside Euphorbia baylissi and Solanum litoraneum. All three of these Vulnerable species are threatened throughout their ranges by conversion of habitat to subsistence agriculture (Matimele et al. 2018, Richards 2021). Currently both threatened species are only known from outside the Pomene National Reserve boundary within this IPA, towards Ponta Barra Falsa, where land is moderately threatened by tourism. Salicornia mossambicensis, one of the eleven endemics at this site, occurs in the salt marshes to the north. Currently assessed as Data Deficient, this species is only known from one other location which, due to its proximity to the city of Inhambane, is highly threatened in this area. The range of S. mossambicensis, based on extent of occurrence calculated using an area of habitat approach (Brooks et al. 2019), is approximately 200 km2, less than the 5000 km2 threshold to qualify as a range restricted endemic under IPA sub-criterion A(iv).

A number of species recorded at this site are also found across the Maputaland CoE in the broadest sense, for instance, Trichoneura schlechteri, has been recorded from this IPA and represents the only collection in Inhambane Province and the most northerly edge of this species' known range. In addition, Encepharlartos ferox subsp. ferox (assessed as NT at species level) has a distribution from Inhambane to KwaZulu-Natal, South Africa, and occurs within the coastal woodland near Ponta Barra Falsa. This cycad is common throughout its range but is threatened by overcollection and the loss of coastal habitat (Donaldson 2010).
The intact coastal habitats at this site, including dune vegetation and mangrove salt marshes to the north, are of clear importance to a number of species with limited distributions. The coastal habitat of Pomene is of particular importance as much of this vegetation is under threat or has already been cleared to make way for subsistence agriculture, with this IPA representing the longest tract of intact coastal forest between the Save River and Maputo (BirdLife International 2001).

Habitat and geology

Pomene, as a coastal site, is underlaid by sandy soils with little organic matter or water retention ability (Macandza et al. 2015). The area of 1 to 2 km westward from the coastline is dominated by coastal dune vegetations types, with pioneer communities on the foredunes including species such as Ipomoea pes-caprae, Cyperus crassipes and Canavalia rosea (Macandza et al. 2015). Further inland is dense coastal thicket dominated by Diospyros rotundifolia and Mimusops caffra, hosting the endemic Elaeodendron fruticosum (LC) and the near-endemic cycad Encephalartos ferox subsp. ferox (assessed as NT at species level). On the most inland section of the coastal dunes, the dense thicket transitions to miombo dominated by Brachystegia spiciformis and Afzelia quanzensis (Macandza et al. 2015).
To the west of the dunes, running from north-east to the south-west of the national reserve, is an area of shrubby grassland. Common shrubby species in these areas include Salacia kraussii, Hyphaene coriacea and Garcinia livingstonei, while dominant grasses include Heteropogon contortus and Imperata cylindrica (Macandza et al. 2015). A number of endemic species inhabit the shrubby-grassland mosaic including Dracaena subspicata and Chamaecrista paralias.
Towards the north of the IPA, surrounding the lagoon and on the banks of Muducha River, is an area of mangrove forest, most of which lies outside the boundaries of the National Reserve. Five mangrove species are known from this area, in order of dominance, these are: Rhizophora mucronata, Avicennia marina, Ceriops tagal, Bruguiera gymnorhiza and Soneratia alba (Louro et al. 2017). The mangrove species are used by local communities for construction as the timber is resistant to insect damage (Macandza et al. 2015). The salt marshes associated with the mangroves are important habitat for the endemic species Psydrax moggii (LC) and Salicornia mossambicensis (DD). This IPA has been delineated to include only the mangroves east of the Muchuda River, however, it should also be noted that there is also a 3 km stretch of mangrove forest to the north of this site, toward Macashale, which is also likely to be of ecological importance.
Seasonally flooded grasslands are found at the margins of the mangroves on the banks of the Muchada River as it approaches the estuary. These areas have not been extensively studied, however, they are known to be dominated by a number of Cyperus species and grasses such as Imperata cylindrica and Dichanthium species (probably D. annulatum) (Macandza et al. 2015). South of the mangroves, the riverbanks are dominated by reedbeds mostly of the species Phragmites mauritianus, while species of the genus Cyperus are common. Coix lacryma-jobi is described by Macandza et al. (2015) as dominant in the reed beds, however, as a non-native species that is not commonly known from this part of Mozambique, it is not clear whether this represents a misidentification or an as yet unrecorded introduction. The herbaceous Rubiaceae Oldenlandia corymbosa has also been recorded from these areas and is likely associated with disturbed areas. There are some large trees on the riverbanks including Ficus species (Macandza et al. 2015). Both the seasonally inundated grasslands and the riverine vegetation are on clay-rich soils with a high organic matter content and high water retention, in contrast to the sandy soils that cover the rest of the IPA (Macandza et al. 2015).
From the centre to the western boundary of the IPA, the vegetation is predominantly miombo, covering nearly 40% of the National Reserve (Macandza et al. 2015). The miombo here is dominated by Julbernardia globiflora, although, like the dune miombo, both Brachystegia spiciformis and Afzelia quanzensis feature heavily in the species composition. Most of this woodland is open with seasonal pools and a grassy understory dominated by Heteropogon contortus, Digitaria eriantha and, in wetter areas, Imperata cylindrica (Macandza et al. 2015). It may be of interest to study these pools for the presence of ephemeral wetland species such as Ammannia, a genus known to include a number of endemic and near-endemic species in Mozambique (Darbyshire et al. 2019). Denser patches of miombo, predominantly south of the settlements within the reserve (centered on -22.98°, 35.55°), have a thinner grass understory and show much less disturbance than the open miombo.

Conservation issues

The Pomene IPA expands upon the current boundary of Pomene National Reserve and only the mangroves and dunes to the north near Pomene Bay and the dunes along the eastern shoreline are not currently protected. The national reserve was established in 1964 and 200 km2 in area was originally designated; however, at present the reserve covers only 50 km2 (Macandza et al. 2015).
Management structures for the reserve were only created in 2009 and subsequently the first management plan, covering the period 2016 – 2020, was set out. This plan included a proposed expansion of the reserve which would cover all of the eastern dunes and the dunes and mangroves in the north of this IPA within the core zone, with the mangroves north of this IPA, towards Macashale, in the buffer zone (Impacto Lda. 2016). Separately, the development of a marine reserve, including the marine and coastal landscape of this

IPA up to Vilankulos Bay, was also proposed recently by a joint public-private initiative. In any case, the proposed expansions would incorporate the entirety of this IPA, which would be of particular importance for the continued integrity of the dunes and northern mangroves.
The reserve itself is not as heavily populated as surrounding areas, however, there were around 500 residents recorded by the reserve administration, concentrated primarily in the north (Impacto Lda. 2016). Land in the wider Massinga area, like much of the reserve, is underlaid by sandy soils with poor fertility, allowing only 2 – 3 agricultural cycles before it is abandoned (Macandza et al. 2015). The resulting scarcity of agricultural land outside the reserve has led people to move inside its boundaries. However, some of the homesteads, particularly in the south, have previously been abandoned, with sources suggesting that people left due to the restrictions on permitted activities within the reserve or to find work elsewhere (Impacto Lda. 2016). Machambas in the north of the reserve are sparsely distributed and most households depend on subsistence farming, growing crops such as maize, cowpea and cassava, as well as breeding poultry, goats and pigs. While poor soils in the region may have driven people to farm land within the reserve, given that soils are similarly poor within the reserve, there is a high threat of shifting agriculture within the reserve as soils exhaust quickly and people are forced to move to gain a sufficient harvest. Agronomic research and support for local people in transitioning to more sustainable agricultural techniques throughout the district could help alleviate land pressure both inside and outside this IPA.
Linked to agriculture is the threat of uncontrolled fires, most of which stem from the use of fire to open up land for farming (Macandza et al. 2015). With high fuel loads and the highest density of people, the miombo and shrubby grassland to the north are at greatest risk from uncontrolled fires.
Wood for domestic fuel is extracted from miombo while timber is extracted from mangroves, particularly trees of larger diameter, for construction of homes and the camps of fisherman who visit the site for the wet season (Louro et al. 2017). The mangrove forest is also thought to experience degradation through the fishing of marine invertebrates such as the giant mud crab (Scylla serrata). A study by Louro et al. (2017) found that up to 41% of trees near the water's edge were cut; however, some regeneration was also observed following felling. The mangroves at Pomene are of great ecological value, with a number of interesting marine species including sea turtle and dolphin species alongside whale shark and possibly dugong (Louro et al. 2017). Mangroves are also known for providing protection against storm surges. It is therefore of upmost importance that this ecosystem is integrated into the protected area network and that only sustainable usage is permitted.
The establishment of zonation to regulate anthropogenic disturbance was suggested in the 2016 – 2020 management plan (see Impacto Lda. 2016). Under this proposal, much of the eastern mangroves, including areas currently outside the reserve, would be placed under a "Community and Resource Use" zone, allowing for the continued use of the area for sustainable subsistence activities but preventing the use of resources for commercial purposes. Much of the rest of the reserve, consisting mostly of open miombo and shrubby grasslands, would be placed under "Resource Management" which suggests further limitations on permitted activities compared to the above zone in an effort to restore grazing mammals and promote tourism. "Special Protection" zones cover the dense miombo and the riverine/estuary vegetation including the seasonally flooded grassland, riverine fringes and some of the western patches of mangrove. In these areas, it is proposed that there would be no extraction of resources, with only the collection of medicinal plants and artisanal fishing for local purposes allowed with written permission from the reserve.
Previous to the first management plan, local initiatives were established with a view to conserving local wildlife. The Pomene Co-management Committee (Comité de Co-gestão Pomene) and the Community Fisheries Council (Conselho Comunitário de Pescas) are two community organisations working in partnership with the reserve administration. Both committees promote community engagement with conservation of both coastal and marine ecosystems through educating local people on the threats to local biodiversity and the benefits of protecting this biodiversity for livelihoods and future generations. Alongside education, patrols are undertaken to detect illegal activities such as uncontrolled fires or the cutting of mangrove or reeds for sale (Macandza et al. 2015). The community engagement prior to the implementation of management plans appears to have had a significant impact on the activities of local communities, with a survey finding that 67% of respondents were aware that there are laws restricting resource use within the reserve (Macandza et al. 2015). In addition, the reserve is one of the most intact stretches of coastline in southern Mozambique which further suggests a level of local adherence.
The high-quality coastal habitat is of particular importance for avian taxa, providing habitat for species such as the globally Near Threatened Plain-backed Sunbird (Cyanomitra verreauxii) and the range restricted species (defined by the Important Bird Area criteria) Apalis ruddi (LC). With a number of threatened and range restricted species, the site was recognised in 2001 as an Important Bird Area.

Site assessor(s)

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IPA criterion A species

SPECIES	QUALIFYING SUB-CRITERION	≥ 1% OF GLOBAL POPULATION	≥ 5% OF NATIONAL POPULATION	1 OF 5 BEST SITES NATIONALLY	ENTIRE GLOBAL POPULATION	SOCIO-ECONOMICALLY IMPORTANT	ABUNDANCE AT SITE
Euphorbia baylissii L.C.Leach	A(i)	✓	✓	✓	–	–	Occasional
Elaeodendron fruticosum N.Robson	A(i)	✓	✓	✓	–	–	Frequent
Salicornia mossambicensis (Brenan) Piirainen & G.Kadereit	A(iv)	✓	✓	✓	–	–	Unknown
Solanum litoraneum A.E.Gonç.	A(i)	✓	✓	✓	–	–	Unknown

IPA criterion C qualifying habitats

HABITAT	QUALIFYING SUB-CRITERION	≥ 5% OF NATIONAL RESOURCE	≥ 10% OF NATIONAL RESOURCE	1 OF 5 BEST SITES NATIONALLY	AREAL COVERAGE AT SITE

General site habitats

GENERAL SITE HABITAT	PERCENT COVERAGE	IMPORTANCE
Marine Coastal/Supratidal - Coastal Sand Dunes	–	Major
Marine Coastal/Supratidal - Coastal Brackish/Saline Lagoons/Marine Lakes	–	Minor
Marine Intertidal - Mangrove Submerged Roots	–	Major
Marine Intertidal - Salt Marshes (Emergent Grasses)	–	Minor
Marine Intertidal - Sandy Shoreline and/or Beaches, Sand Bars, Spits, etc.	–	Minor
Marine Intertidal - Tidepools	–	Minor
Grassland - Subtropical/Tropical Seasonally Wet/Flooded Lowland Grassland	–	Minor
Savanna - Moist Savanna	–	Major
Forest - Subtropical/Tropical Mangrove Forest Vegetation Above High Tide Level	–	Major
Artificial - Terrestrial - Arable Land	–	Minor

Land use types

LAND USE TYPE	PERCENT COVERAGE	IMPORTANCE
Nature conservation	67	Major

LAND USE TYPE	PERCENT COVERAGE	IMPORTANCE
Agriculture (arable)	5	Minor
Tourism / Recreation	5	Minor

Threats

THREAT	SEVERITY	TIMING
Residential & commercial development - Tourism & recreation areas	Medium	Ongoing - trend unknown
Agriculture & aquaculture - Annual & perennial non-timber crops - Shifting agriculture	Medium	Ongoing - trend unknown
Agriculture & aquaculture - Marine & freshwater aquaculture - Subsistence/artisinal aquaculture	Low	Ongoing - trend unknown
Biological resource use - Logging & wood harvesting	Low	Ongoing - trend unknown
Natural system modifications - Fire & fire suppression - Increase in fire frequency/intensity	High	Ongoing - trend unknown

Protected areas

PROTECTED AREA NAME	PROTECTED AREA TYPE	RELATIONSHIP WITH IPA	AREAL OVERLAP
Pomene National Reserve	National Reserve	IPA encompasses protected/conservation area	67

Conservation designation

DESIGNATION NAME	PROTECTED AREA	RELATIONSHIP WITH IPA	AREAL OVERLAP
Pomene	Important Bird Area	IPA encompasses protected/conservation area	67

Management type

MANAGEMENT TYPE	DESCRIPTION	YEAR STARTED	YEAR FINISHED
Protected Area management plan in place	A management plan was drawn up by Impacto Lda. in 2016.	2016	2020

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