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KEY BIODIVERSITY AREAS (KBAs) IDENTIFIED IN MOZAMBIQUE: FACTSHEETS VOL. II

RED LIST OF THREATENED SPECIES AND ECOSYSTEMS, IDENTIFICATION AND MAPPING OF KEY BIODIVERSITY AREAS (KBAS) IN MOZAMBIQUE

KBA KEY BIODIVERSITY AREA

RED LIST

Supporting the Policy Environment for Economic Development (SPEED+)

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INTRODUCTION

Key Biodiversity Areas (KBAs) are sites contributing significantly to the global persistence of biodiversity, both in terrestrial, freshwater, marine and underground systems. KBAs are identified based on internationally accepted scientific criteria, allowing to support i) spatial planning and conservation priority setting, ii) strategic expansion of protected area networks, iii) inform environmental safeguard policies for the private sector, iv) provide opportunities for local communities, and v) are indicators of Convention of Biological Diversity (CBD) Aichi Targets 11 and 12, as well as Sustainable Development Goals (SDGs) 14 and 15.

The global standard for identifying KBAs was established in 2016 through the KBA Partnership, which is currently composed of 13 of the world's leading nature conservation organizations, whose goals are to identify, map and document KBAs globally, as well as promote conservation actions and inform and influence public policy and private sector decision making that impacts KBAs.

Recognizing the importance of this initiative in improving conservation activities, the United States Agency for International Development (USAID), through the SPEED+ Project "Supporting the Policy Environment for Economic Development", funded the project "Red List of Threatened Species, ecosystems, identification and mapping of Key Biodiversity Areas (KBAs) in Mozambique", which started in February 2019 in a collaborative partnership between WCS-Mozambique, and the National Directorate of Environment (DINAB),under the Ministry of Land and Environment (MTA)

The implementation of the project involved the creation of a coordination team and 8 technical taxonomic working groups (plants, insects, reptiles and amphibians, freshwater fish, birds, mammals, marine biodiversity in general, and terrestrial ecosystems).

The project had the involvement and contribution of more than 100 national, regional and international experts, and more than 20 national institutions (government, academia, research institutions, conservation partners, Civil Society and the private sector). Three major workshops, involving about 130 people, were held to train Mozambican experts on Red List criteria, identification of KBAs, and delineation of KBA boundaries. Dozens of face-to-face and remote meetings were held to share information, including specific meetings to establish the National Coordinating Group, and to validate proposed KBAs.

As a result, the project allowed to formally establish the National Coordination Group that guides not only the KBAs process, but also the Red Listing. It is currently composed of about 20 institutions, many of them from the Government, being chaired by DINAB. The project identified and mapped 29 KBAs for Mozambique, of which 25 are terrestrial, and 4 are marine occupying a total area of 139,947.05 km^2. At least 15 areas with potential to be triggered as KBAs in the future have also been identified, provided that more information is collected to reapply the criteria.

The 29 KBAs were triggered by 180 species, with the majority consisting of plant species (57%). Plants were also responsible for triggering most of the KBAs, namely 18 of the 29 identified. The B1 criterion (applied to restricted range species) was responsible for triggering 79 % of the KBAs, indicating that most of the triggering species are endemic or near-endemic to Mozambique.

The 29 KBAs that were identified and mapped through this project are crucial to guide the preparation of development and land use plans (terrestrial and marine), from the local to the national level. Their inclusion as a decision-making support tool helps to minimize the impact of infrastructure and development projects and to support the strategic expansion of the national network of Protected Areas, strengthening the conservation policy framework.

The information produced thorough this project contributes to the achievement of CBD goal 12 that encourages countries to ensure the protection of all endemic, rare and threatened species. It also contributes to the effective implementation of the National Biodiversity Strategy and Action Plan (NBSAP) required by the Convention on Biological Diversity (CBD), constituting a valuable tool for Mozambique to align with the new global Biodiversity framework post-2020.

ABOUT THIS REPORT

This report corresponds to Volume II of the complete package of the project "*Red List of Threatened Species, Ecosystems, Identification and Mapping of Key Biodiversity Areas (KBAs) in Mozambique*", which is comprised of 3 other volumes that can be consulted independently:

VOL. I - Final Report: Red List of threatened species, ecosystems, identification and mapping of Key Biodiversity Areas (KBAs) in Mozambique (available in Portuguese and English)

VOL. III - Brief analysis and recommendations on the type of management and possible protection for the Key Biodiversity Areas (KBAs) identified in Mozambique (only available in Portuguese)

VOL. IV - Legal Framework of the Red List of Threatened Species and Ecosystems and of the Key Biodiversity Areas (KBAs) in Mozambique (only available in Portuguese)

This report presents the factsheets for each of the 29 KBAs identified under this project, which briefly describe the characteristics of the site, the rationale behind them, the triggered criteria, the triggering species, and the main threats to which they are subject.

PHOTO CREDITS

COVER - Frank af Petersens. INSIDE; Njesi landscapes - Mac Stone/BINGO; *Cordylus meculae* - William Branch, *Artisornis sousae* - Sam Jones; Niassa Special Reserve landscapes - Valdemar Jonasse, *Lycaon pictus* - Thomas Retterath; Palma landscapes - John Burrows, *Nothobranchius hengstleri* - Béla Nagy, *Ochna dolicharthros* - Frances Chase; Vamizi landscape - Craft of architecture, *Caranx ignobilis* - Randall, J.E. ; Quiterajo landscape top and last - Jonathan Timberlake, bottom - John Burrows, *Acacia quiterajoensis* - Warren McCleland, *Warneckea cordiformis* - John Burrows; Taratibu landscape top - John Burrows, bottom - Hugo Costa, *Nothophryne unilurio* - Harith Farooq; Eráti landscape - Hugo Costa; Matibane Forest Reserve landscape - Mervyn Lotter, *Icuria dunensis* - Jo Osborne; Mount Ribàué-Mphalwe landscape - Ton Rulkens, *Aloe rulkensii* - T Rulkens, *Nothophryne ribauensis* - Conradie et al.; Mount Inago landscape & *Cymothoe baylissi* - Julian Bayliss, *Rhampholeon bruessoworum* - EDGE programme, APAIPS landscape - WWF, *Icuria dunensis* - Jo Osborne, Mount Namuli landscape - Jonathan Timberlake, *Apalis lynesi* - Ross Gallardy, *Paraxerus vincenti* - Ronnie Owens, *Rhampholeon namuli* - Julian Bayliss; Mount Mabu landscape - Jonathan Timberlake, *Atheris mabuensis & Nadzikambia baylissi* - Julian Bayliss, *Swynnertonia swynnertoni* - Francois du Plessis; Mount Chiperone landscape - Julian Bayliss, *Chamaetylas choloensis* - Nik Borrow, *Rhampholeon nebulauctor* - Harith Farooq; Derre Forest Reserve landscape - Natasha Ribeiro, *Tarenna longipedicellata* - Bart Wursten, *Nothobranchius krysanovi* - Brian Watters; Tchuma Tchato landscape - Mervyn Lotter, *Oreochromis mortimeri* - Michael K. Oliver; Serra Choa landscape top - Ton Rulkens & overleaf left- John Burrows, *Hirundo atrocaerulea* - Warwick Tarboton; Machipanda landscape - Senorhorst Jahnsen, *Hirundo atrocaerulea* - Warwick Tarboton; Chimanimani landscape - Marc Stalmans, *Dissotis pulchra* - Bart Wursten, *Strongylopus rhodesianus* - Alan Channing, *Rhampholeon marshalli* - Mike Buckham, *Xyris asterotricha* - Sharon Louw; Gorongosa-Marromeu - Marc Stalmans, *Rhampholeon gorongosae* - Piotr Naskrecki, *Bugeranus carunculatus* - Gerhard Theron, *Panthera leo* - Gorongosa Lion Project; Inhassoro-Vilankulos landscape - Marc Stalmans, *Xylia mendoncae*, *Croton inhambanensis & Ecbolium hastatum* - Warren McCleland; landscape overleaf - John Burrows; Grande Bazaruto landscape - Marc Stalmans, *Jatropha subaequiloba* - T Rulkens, dune landsacpe - John Burrows; Tofo landscape - Mervyn Lotter, *Mobula birostris* - Andy Murch, *Stegostoma tigrinum* - Ross D. Robertson, *Rhincodon typus* - Derek Keats, *Mobula alfredi* - Guy Stevens; Chongoene landscape - Marc Stalmans; Manhiça-Bilene landscape - John Burrows, *Raphia australis* - Ton Rulkens, *Chetia brevis* - Rob Palmer, *Memecylon incisilobum* - John Burrows; Matutuíne landscape - Hendrik van den Berg, *Sclerochiton apiculatus* - Naseeba Sidat; Licuáti Forest Reserve - Naseeba Sidat & overleaf - John Burrows, *Psydrax fragrantissima* - Cefox, *Empogona maputensis* - Francois du Randt, Maputo Special Reserve - Marc Stalmans, *Silhouettea sibayi* - Ricky Taylor, *Scarabaeus bornemizzai* - Christian Deschodt, *Loxodonta africana* - Colina Verdemoz; Ponta do Ouro landscape - sunsafaris & overleaf Marc Stalmans, *Sousa plumbea* - Brett Atkins, *Parablennius lodosus* - Etrusko25, *Caranx ignobilis* - reeflifesurvey.com.

HOW ARE KBAs IDENTIFIED?

The process for identifying and delineating Key Biodiversity Areas (KBAs) followed the new KBA Global Standard (IUCN, 2016), which establishes all the criteria to assess and identify sites as KBAs and can be applied at different levels: genetic diversity, species and ecosystems. Collectively, the criteria address different aspects by which sites contribute significantly to the global persistence of biodiversity. In total, there are 11 criteria grouped into 5 categories, namely:

A. Threatened biodiversity (Criteria A1 and A2)
B. Geographically restricted biodiversity (Criteria B1, B2, B3 and B4)
C. Ecological integrity (Criterion C)
D. Biological processes (Criteria D1, D2 and D3)
E. Very high irreplaceability, as determined through quantitative analysis (Criterion E)

The KBA criteria provide quantitative thresholds to ensure that KBA identification is objective, repeatable, and transparent. Different parameters can be used for the assessment, in the following order of priority: (i) number of mature individuals, (ii) area of occupancy, (iii) extent of suitable habitat, (iv) range, (v) number of localities, and (vi) distinct genetic diversity.

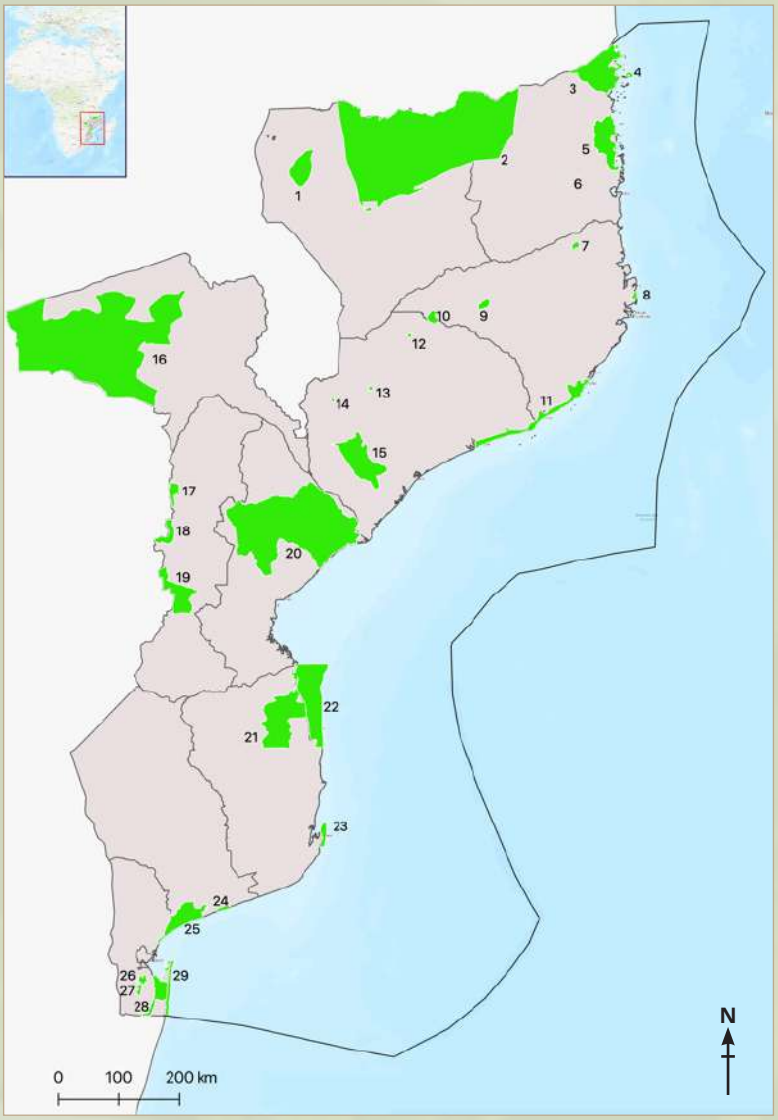
Sites should ideally be assessed against all relevant criteria for which data are available, but meeting thresholds under any of the criteria or sub-criteria is enough for a site to be recognized as a KBA, provided that supporting documentation requirements are properly met. Individual biodiversity elements may trigger more than one criterion at the same site (IUCN, 2016). For more details on the KBA criteria and how they should be appropriately applied, please consult the global KBA guidelines (IUCN,2020)

Within the scope of this assessment, it was not possible to apply all existing KBA criteria, only those relevant to the species were considered. Criteria A2, B4 and C applicable to ecosystems were not used. Other criteria such as B3, D1a, D3 were not applied due to lack of available information. The table below shows all criteria along with their thresholds, which have been applied as part of the assessment conducted in Mozambique. Since population data are not available for most species, in many cases, especially for plants, herpetofauna, freshwater fish, and insects, assessments were conducted using distribution parameters (e.g. range or localities).

A. THREATENED BIODIVERSITY	
A1a	≥0.5% of global population size and ≥5 reproductive units (RU) of a CR/EN species
A1b	≥1.0% of global population size and ≥10 RU of a VU species
A1c	≥0.1% of global population size and ≥5 RU of a species listed as CR/EN due only to past/current decline [= Red List A1, A2, A4 only]
A1d	≥0.2% of global population size and ≥10 RU of a species listed as VU due only to past/current decline [= Red List A1, A2, A4 only]
A1e	Effectively the entire population size of a CR/EN species
B. GEOGRAPHICALLY RESTRICTED BIODIVERSITY	
B1. Individual geographically restricted species	≥10% of global population size and ≥10 RU of any species
B2. Co-occurring geographically restricted species	≥1% of global population size of each of a number of restricted range species in a taxonomic group: ≥2 species or 0.02% of the total number of species in the taxonomic group, whichever is larger
D. BIOLOGICAL PROCESSES	
D1.	Demographic aggregations
D1b	Site is among largest 10 aggregations of the species

KBAs IDENTIFIED BY THE PROJECT

During the first phase of the project *"Red List of Threatened Species and Ecosystems and Identification and Mapping of Key Biodiversity Areas (KBAs) in Mozambique"*, **29 KBAs** were identified and mapped.



LEGEND

- Mozambique EEZ
- 29 Identified KBAs
- Mozambique provinces

KBA	PROVINCE
1. **Njesi Plateau**	Niassa
2. **Niassa Special Reserve**	Niassa
3. **Palma**	Cabo Delgado
4. **Vamizi**	Cabo Delgado
5. **Quiterajo**	Cabo Delgado
6. **Taratibu**	Cabo Delgado
7. **Eráti**	Nampula
8. **Matibane Forest Reserve**	Nampula
9. **Ribáuè-Mphalwe**	Nampula
10. **Mount Inago**	Nampula
11. **APAIPS**	Zambezia
12. **Mount Namuli**	Zambezia
13. **Mount Mabu**	Zambezia
14. **Mount Chiperone**	Zambezia
15. **Derre Forest Reserve**	Zambezia
16. **Tchuma-Tchato-Cahora Bassa Lake**	Tete
17. **Serra Choa**	Manica
18. **Machipanda**	Manica
19. **Chimanimani National Park**	Manica
20. **Gorongosa and Marromeu Complex**	Sofala
21. **Inhassoro-Vilankulos**	Inhambane
22. **Great Bazaruto**	Inhambane
23. **Tofo**	Inhambane
24. **Chongoene**	Gaza
25. **Manhiça-Bilene**	Gaza
26. **Matutuine**	Maputo
27. **Licuáti Forest Reserve**	Maputo
28. **Maputo Special Reserve**	Maputo
29. **Ponta do Ouro Partial Marine Reserve**	Maputo

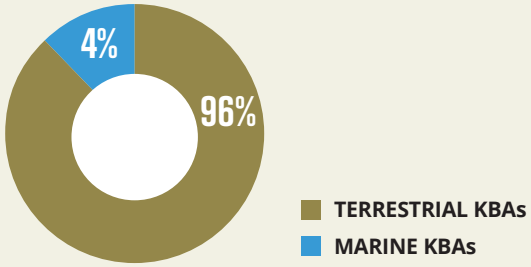
OTHER POTENTIAL AREAS WHICH NEED MORE INFORMATION TO TRIGGER KBAs

There are **15 areas**, which were not triggered as KBAs but that have potential for such. Additional information needs to be collected about the triggering species that occur there, and also about current threats. Therefore, it is possible that these sites might be triggered as KBAs in the near future.

	NAME	PROVINCE
1	Pemba Bay	Cabo Delgado
2	Memba	Nampula
3	Morrumbala	Zambézia
4	North Region of Mount Namuli	Zambézia
5	Buzi	Sofala
6	Sofala Bank	Sofala
7	Coutada 5	Sofala
8	Inharrime	Inhambane
9	Panda-Mandlakazi	Inhambane
10	Pomene National Reserve	Inhambane
11	Limpopo National Park	Gaza
12	Inhaca Island	Maputo
13	Mount Libombos	Maputo
14	Maputo North	Maputo
15	Maputo Bay	Maputo

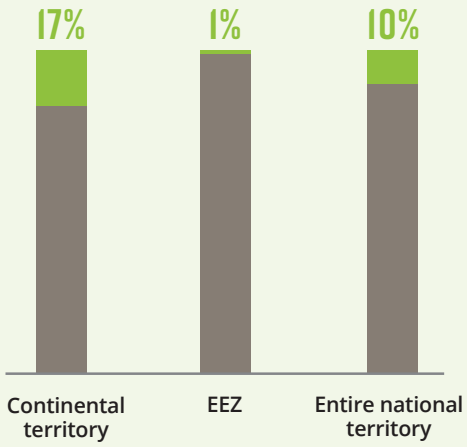
NUMBER OF KBAs IDENTIFIED IN TERRESTRIAL AND MARINE REALMS

The KBAs identified in this project, cover a total area of about **139,947.05 km²**, from which about 96% correspond to **25 terrestrial** KBAs and 4% to **4 marine** KBAs.



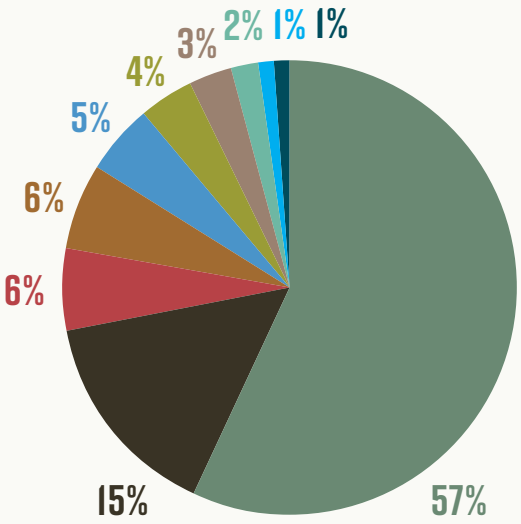
COVERAGE OF THE KBAs IDENTIFIED IN MOZAMBIQUE

KBAs cover **10% of the entire national territory**, with terrestrial, and freshwater KBAs covering 17% of the continental territory and marine KBAs covering 1% of the Exclusive Economic Zone .



% OF TRIGGER SPECIES BY TAXONOMIC GROUPS

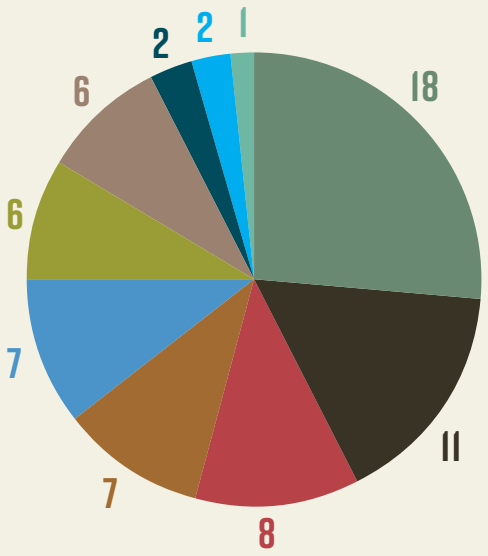
The 29 KBAs were **triggered by 180 species**, of which, the majority are plant species (57%). The groups with the lowest number of triggering species were marine mammals and marine fishes (*Osteichthyes*), both with only 1%.



- PLANTS
- TERRESTRIAL REPTILES
- BIRDS
- INSECTS
- FRESHWATER FISH
- AMPHIBIANS
- TERRESTRIAL MAMMALS
- MARINE FISH (CHONDRICHTHYES)
- MARINE FISH (OSTEICHTHYES)
- MARINE MAMMALS

NUMBER OF KBAs BY TAXONOMIC GROUPS

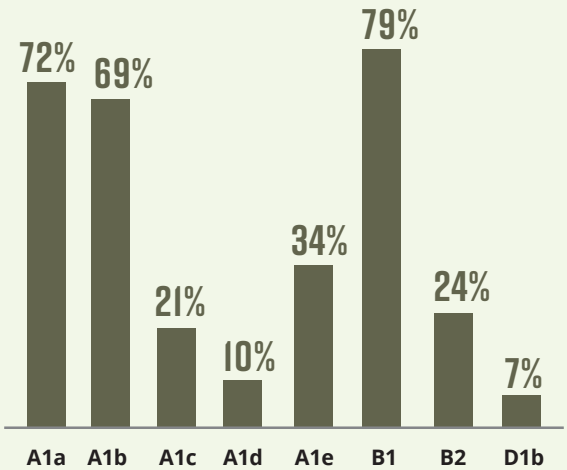
The taxonomic group that triggered the most KBAs was the plant group, having triggered 18 of the 29 identified KBAs, followed by terrestrial reptiles with 11 KBAs. The marine fish (*Chondrichthyes*) was the group with the fewest number of KBAs triggering only one KBA.



- PLANTS
- TERRESTRIAL REPTILES
- BIRDS
- INSECTS
- FRESHWATER FISH
- AMPHIBIANS
- TERRESTRIAL MAMMALS
- MARINE MAMMALS
- MARINE FISH (OSTEICHTHYES)
- MARINE FISH (CHONDRICHTHYES)

% OF KBA CRITERIA TRIGGERED

Criterion B1 - applied to species with restricted distribution, was the most frequently triggered, (in around 79 % of the total KBAs), suggesting that most of the KBAs triggering species are endemic or near-endemic to Mozambique. The second most triggered criterion was A1a (applied to endangered EN and critically endangered CR species). The criterion D1b related to ecological aggregations was the less triggered.

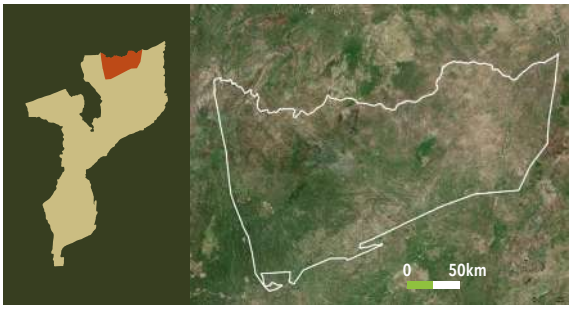


- % OF KBAs TRIGGERED OVER ALL SITES

KEY BIODIVERSITY AREAS

NIASSA SPECIAL RESERVE

SITE ID: 49163



ADMIN REGION: Niassa

KBA AREA: 42,707.52 km²

COORDINATES: -12.07 S, 37.44 E

CURRENT PROTECTION CATEGORY: Special Reserve, Buffer Zone

PRE-EXISTING DESIGNATION: N/A

KBA CRITERIA TRIGGERED: A1a, A1b, A1c, A1d, B1

SITE DESCRIPTION

This KBA encompasses the Niassa Special Reserve (NSR), including its buffer zone, covering an area of about 42,707 km². The NSR was recategorized in May 2020 by the Council of Ministers and is Mozambique's largest conservation area (and the third largest protected area in Africa). It covers two provinces: Niassa and Cabo Delgado and is believed to support the largest concentration of wildlife remaining in Mozambique (Bauer et al., 2015). The NSR is connected to the Selous Game Reserve in Tanzania to the north, through the Selous-Niassa corridor, which allows wildlife to move between the two Reserves (Allan et al., 2017). Together, the NSR and the Selous Game Reserve form a massive ~150,000 km² trans-frontier conservation area (Booth and Dunham, 2014; Allan et al., 2017), albeit not yet being effectively managed as such. The climate of the area is tropical sub-humid, with mean annual rainfall of 900 mm. The annual mean temperature ranges between 20°C to 26°C during the dry season from May to October and it is about 30°C during the wet season from November to April. NSR is well known for its spectacular granite inselbergs that stand above the surrounding landscape (Booth and Dunham 2014). Drainage is dominated by the Rovuma and Lugenda Rivers, which are large, braided, sand rivers with strong perennial flows (Booth and Dunham 2014). A central watershed between these rivers feeds an extensive network of seasonally inundated wetlands or dambos as well as numerous seasonal rivers lined with dense riparian woodland (Booth and Dunham 2014). Around 70% of the NSR is covered by miombo woodland interspersed with drier areas of bushed savannah, which includes over 800 species of plants, half of which are endemic (Ribeiro et al., 2018; Booth and Dunham 2014).

TRIGGER SPECIES

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MAIN THREATS

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RATIONALE

NSR is renowned for having the largest and best-preserved tracts of miombo woodland left in Africa (Ribeiro et al., 2008), providing critical habitat for many of Africa's wide-ranging species and threatened mega-fauna (Bauer et al., 2015). Faunal importance of the NSR is illustrated by seven species meeting KBA criteria, including mammals, freshwater fish, and reptiles. The **seven trigger species** comprise four threatened mammals including the African Elephant (*Loxodonta africana*, EN), Lion (*Panthera leo*, VU), Wild dog (*Lycaon pictus*, EN) and Hippopotamus (*Hippopotamus amphibius*, VU). Additional trigger elements at this site include one threatened and endemic freshwater fish, the Killifish (*Nothobranchius niassa*, VU). The species' entire population is inside the NSR (Valdesalici et al., 2012). The sixth and seventh trigger elements are reptiles, including the threatened Zambezi Flapshell Turtle (*Cycloderma frenatum*, EN) and the range restricted Girdled lizard (*Cordylus meculae*, LC) only found in Mecula within the NSR and on Mount Sanga and Chitagal. Besides these species, the NSR is also home to several threatened bird species, such as Lappet-Faced Vulture (*Torgos tracheliotos*, EN), White-backed Vulture (*Gyps africanus*, CR) and the Taita Falcon (*Falco fasciinucha*, VU). Despite being regarded as an area of high biodiversity importance, the NSR faces numerous challenges. These include the growing human population of more than 60,000 people found in 42 villages inside this protected area. These communities conduct shifting agriculture, bushmeat hunting and alluvial mining, all of which impact the biodiversity of NSR (Niassa Carnivore Project, 2018). In spite of the challenges, Niassa Special Reserve has been identified as a critical protected area for continent-wide lion recovery given that it could well support over 1,000 individuals (Lindsey et al., 2017). In addition, it is believed that the NSR can potentially support approximately 50,000 elephants, which is over ten times its current population (Robson et al., 2017). Currently, the residual wildlife populations are still large enough to extent that they could recover naturally if levels of persecution decreased, and threats are managed. The KBA status highlights the importance of this site in contributing to the persistence of global biodiversity.

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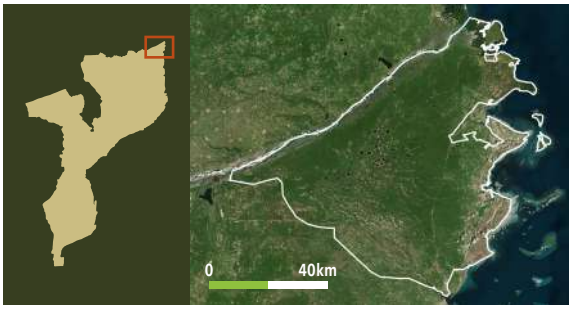
KEY BIODIVERSITY AREAS

PALMA

SITE ID: 49159



ADMIN REGION: Cabo Delgado

KBA AREA: 4,555.62 km²

COORDINATES: -13.87 S, 39.81 E

CURRENT PROTECTION CATEGORY: Partially covered by game farms

PRE-EXISTING DESIGNATION: N/A

KBA CRITERIA TRIGGERED: A1a, A1b, A1e, B1, B2

SITE DESCRIPTION

This site covers most of Palma district located at the north-east end of Cabo-Delgado Province, about 484 km away from Pemba in Northern Mozambique. Its borders include the Rovuma River to the North, which is also the border with Tanzania, Nangade district to the West, Mocímboa da Praia to the South and the Indian Ocean to the East (MICOA 2012; MAE, 2014). The proposed site covers an area of about 4,556 km² and also includes a small portion of the northern part of the Nangade district (West of Palma) and Mocímboia da Praia (South of Palma). The climate is regarded as dry sub-humid with annual mean temperature of 26.2ºC as the hot and rainy season can reach 35ºC with annual rainfall ranging from 800 to 1,000 mm. Soils are mainly sandy, ranging from washed to slightly washed, predominantly yellow to greyish-brown. Palma district lies mostly between 80 and 180 m above sea-level. Vegetation of major interest is the so called dry coastal forest and it is within the Zanzibar-Inhambane regional mosaic, a phytochorion ranging from Somalia southwards to South Africa through the coastline (Timberlake et al., 2011), which is of global conservation importance. According to Timberlake et al. (2011), the flora in this area is very distinguished and differs from that occurring more inland through the Zambezian regional center of endemism. For over a decade, Palma district has gained more attention due to discoveries of onshore oil and gas which brings enormous pressure to biodiversity. More recently it has been one of the focus areas of armed conflict in Cabo Delgado, between insurgents and the national defense forces.

TRIGGER SPECIES

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MAIN THREATS

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RATIONALE

Palma district is home to number of rare, range restricted and endemic or near-endemic species across several taxonomic groups of fauna and flora. Being within White's Zanzibar-Inhambane regional mosaic, Palma has a distinctive flora, particularly from the coastal dry forests. A total of **17 species triggered the KBA criteria** at this site, of which 14 are restricted range plant species, namely eight Endangered (EN) (*Oxyanthus biforus*, *Grewia limae*, *Chassalia colorata*, *Crossopetalum mossambicense*, *Oxyanthus strigous*, *Didymosalpinx callianthus*, *Vepris allenii and Pavetta lindina*) three Vulnerable (VU): (*Cofea schliebenii*, *Clerodendrum lutambense* and *Ochna dolicharthros*), one Near Threatened (NT) (*Ormocarpum schliebenii*) and two LC (*Acacia quiterajoensis* and *Mimosa busseana*). In addition to plant species, the trigger species include two threatened freshwater fish namely: *Nothobranchius hengstleri* (EN) and *Nothobranchius krammeri* (VU), and the reptile *Scolecoceps broadleyi* (LC) of conservation importance due to its narrow distribution. Because it hosts significant populations of the 17 species mentioned above, Palma qualifies as a Key Biodiversity Area. It is hoped that this KBA status can catalyze the mobilization of resources to ensure the proper management of the area, so that global biodiversity can persist over time.

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KEY BIODIVERSITY AREAS

VAMIZI

SITE ID: 49173

ADMIN REGION: Cabo Delgado

KBA AREA: 86.5 km²

COORDINATES: -13.94 S, 39.29 E

CURRENT PROTECTION CATEGORY: Community Sanctuary (not yet formalised)

PRE-EXISTING DESIGNATION: N/A

KBA CRITERIA TRIGGERED: D1b

SITE DESCRIPTION

Vamizi is a tropical island situated at 11°S in the Northern Mozambique; it has approximately 12 km long and 2 km wide stretching along an east–west axis. The KBA has 86.5 km². It is bounded to the north and south by deep canyons. Close to 500 m deep, these canyons supply cooler water to the reefs from the depths of the Mozambique Channel, which may offer protection from warm water events and thus avert coral bleaching (Davidson et al. 2006). The island is surrounded by a fringing reef with associated shallow lagoon where coral bommies are interspersed with sandy patches. At the northern edge of this platform, the reef slopes plunge steeply into the canyons, whereas the eastern edge is a vertical wall with numerous overhangs. The southern and western side of the island has a gentle slope in shallow lagoon with patchy seagrass meadows, macroalgae, coral bommies and coral reef patches. On the north side, the coral form a continuous barrier between live coverage of 30-60% and is dominated by *Acropora* species (Davidson et al. 2006, Hill et al. 2009, Sola, Silva, et al. 2015). The island is situated where the South Equatorial Current splits into the north-flowing East African Current and south-flowing Mozambique Current and this Northern Mozambique Channel (NMC) area has been described as the second hotspot of Indo-Pacific marine biodiversity (Obura 2012, McClanahan et al. 2014). Vamizi Island is under influence of the northeast monsoon from October to March, which bring warm temperatures and seasonal rains while the southeast monsoon, from April to September is associated with the cooler dry season (Davidson et al. 2006). While Vamizi Island sits outside the boundaries of the Quirimbas National Park, it benefits from the protection of a community-based management regime.

TRIGGER SPECIES

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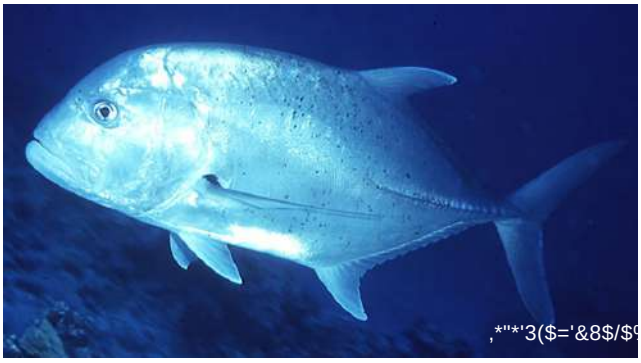

MAIN THREATS

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RATIONALE

This site is one of 10 largest aggregations of giant trevally (*Caranx ignobilis*), estimated at more than 1,000 individuals by Silva et al. (2014). It is only second to the largest aggregation worldwide recorded by Daly et al. (2018) in Ponta do Ouro Partial Marine Reserve (PPMR), which provides the maximum estimate of 2,413 individuals. The record of Silva et al. (2014) at this site represented the first identified spawning location for giant trevally in the Western Indian Ocean.

Establishing the occurrence of a vital process such as the spawning location of a large valuable teleost predator reinforce the no-take designation at this site (Silva et al. 2014) and highlights the importance of developing community co-fisheries management programs for protecting such processes (Silva et al. 2014). This is particularly important for giant trevally because spawning locations are considered to be highly predictable due to their stable occurrence over space and time (Silva et al. 2014).

This site also hosts some of the most diverse and pristine coral reefs of East Africa (Garnier et al. 2008, Hill et al. 2009, McClanahan & Muthiga 2011, Obura 2012).

In addition, there are mass-spawning events occurring every year on the reefs of the Vamizi, and likely extending to adjacent islands of Metundo, Rongui and Tecomaji, which involves the synchronized reproduction of tens of coral species (Sola et al. 2016).

In addition, Vamizi is a confirmed rookery for green turtles *Chelonia mydas* (EN) and hawksbill turtles *Eretmochelys imbricata* (CR) (Pereira et al. 2009, 2014, Garnier et al. 2012), where the highest density of nests, countrywide, are recorded annually for the former species (Louro et al. 2006, Pereira et al. 2009). The ca. 50 females that nest annually in Vamizi represent the most important green turtle population in Mozambique (Trindade, 2012).

In summary, in addition to triggering the threshold for a KBA criterion for an important fish species, this site contains a wide variety of marine biodiversity of regional and global importance and is the scene for key biological processes, which, combined with the existence of a climate-adaptive center, make it a site where high biodiversity may persist in a changing climate, assuming that effective measures are implemented to manage for its resilience.

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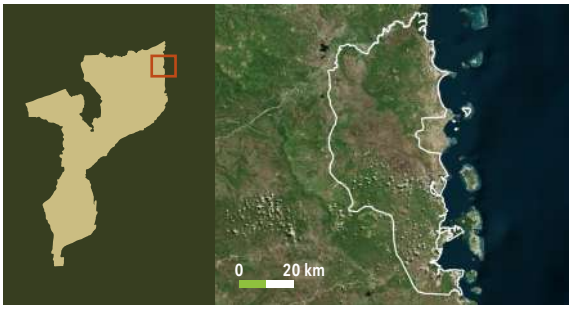
KEY BIODIVERSITY AREAS

QUITERAJO

SITE ID: 49162



ADMIN REGION: Cabo Delgado

KBA AREA: 3,063.8km²

COORDINATES: -12.01 S, 31.35 E

CURRENT PROTECTION CATEGORY: Partially included in a National Park and covered by game farms

PRE-EXISTING DESIGNATION: N/A

KBA CRITERIA TRIGGERED: A1a, A1b, A1e, B1, B2

SITE DESCRIPTION

The Quiterajo KBA is a coastal area found in Macomia district, about 45 km south of Mocímboa da Praia in Cabo Delgado province, Northern Mozambique. This site covers an area of about 3,063.80 km² and it runs southward into the Quirimbas National Park which has been declared a Biosphere Reserve by UNESCO. The annual average temperatures range between 24 ºC and 26 ºC (MAE, 2014). The rainfall average is around 900 -1,100 mm/year. Potential evapotranspiration (Penman) significantly exceeds rainfall from May to November–December, giving a growing season of around 4–5 months (Pascal, 2011). The rains generally start in early December, with a long hot dry period before that. In terms of vegetation this site holds various types of dry forest, miombo woodland, mixed woodland, floodplain grassland, small lakes and grassy drainage lines (Timberlake et al., 2011; Pascal, 2011). In the coastal zone, there are also mangroves and flooded herbaceous vegetation (MAE, 2014). This area has a significant diversity of species of wild animals, reptiles, birds and plants (MAE, 2014). This is also one of the focus areas of armed conflict in Cabo Delgado, between insurgents and the national defense forces.

TRIGGER SPECIES

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MAIN THREATS

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RATIONALE

Timberlake et al. (2011) have highlighted Quiterajo as one of the four key areas (together with Pundanhar-Nangade, Rio Macanga-Nhica do Rovuma and Lupangua) for conservation of coastal forests and associated vegetation types in northern Mozambique. This conclusion was achieved as a result of extensive expeditions carried out in the coastal forests of Northern Mozambique in 2008 and 2009, which regarded Quiterajo as being home to number of rare, range restricted and endemic or near-endemic species, particularly for flora (Timberlake et al., 2010; Pascal, 2011). A total of **15 plant species among rare, range restricted and threatened triggered KBA status** in Quiterajo. There are seven threatened species where one is Critically Endangered (*Warneckea cordiformis*), six are Endangered: *Grewia limae*, *Oxyanthus strigosus*, *Pavetta lindina*, *Tarenna pembensis*, *Pseudomussaenda mozambicensis* and *Vepris allenii*; and three are Vulnerable: *Micklethwaitia carvalhoi*, *Stylochaeton tortispathus* and *Acacia latispina*. The list of trigger species includes restricted range species, such as: *Ormocarpum schliebenii*, which is Near Threatened, and Four Least Concern species: *Acacia quiterajoensis*, *Justicia gorongozana*, *Mimosa busseana* and *Maerua andradae*. This illustrates that Quiterajo, being within White's Zanzibar-Inhambane regional mosaic, holds a unique flora particularly from the coastal dry forests. There are also two species of conservation concern, namely *Chassalia colorata* (EN) and *Duosperma dichotomum* (VU) which did not trigger the criteria at this site. However, these species trigger KBA status in Palma where they are known to occur in more than one locality.

Quiterajo holds a significant portion of a much more extensive complex of coastal forests in northern Mozambique, which is probably the largest remaining area of this forest type on the Eastern African coast. Due to what is explained above, it has been shown that the biodiversity in Quiterajo is of global importance, and therefore qualifies as a Key Biodiversity Area. Hopefully this status will catalyse actions to supress ongoing threats on an unprotected global resource.

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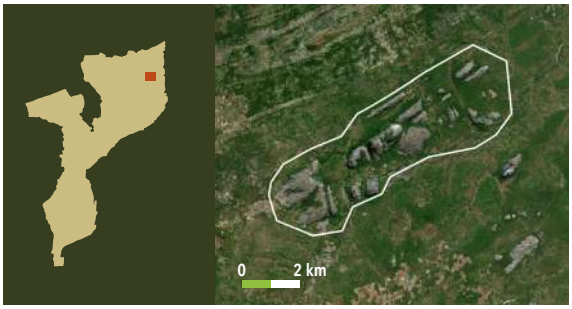
KEY BIODIVERSITY AREAS

TARATIBU

SITE ID: 49170



ADMIN REGION: !Cabo Delgado!!

KBA AREA: !25km²

COORDINATES: -12.82 S, 39.68 E

CURRENT PROTECTION CATEGORY: Included in a National Park, Buffer Zone and a private concession

PRE-EXISTING DESIGNATION: N/A

KBA CRITERIA TRIGGERED: A1a, A1e, B1

SITE DESCRIPTION

Taratibu is an area which is partially within the Quirimbas National Park (QNP) in Cabo Delgado Province, Northern Mozambique. The KBA covers an area of about 25 km² and lies within the Taratibu concession area, comprised of 35,000 hectares located at bloc "A" of the QNP, between southern Latitudes 12º 0' S and 12º 38' S, and Eastern Longitudes 39º 32' E and 39º 58' E (Nanvonamuquitxo et al., 2019). The climate in this site is dry sub-humid with two distinctive seasons which include a hot and rainy season, and a much cooler and dry season from May to September. The average temperature throughout the year varies between 20 ºC and 25 ºC (Nanvonamuquitxo et al., 2019). The annual rainfall ranges from 800 to 1,200 mm, between October and March. The typical phytoecology of the region is the miombo woodland (Nanvonamuquitxo et al., 2019, Sitoe et al., 2010). According to Nanvonamuquitxo et al. (2019), this area has a history of disturbance by logging, fire use and the common practice of shifting agriculture.

TRIGGER SPECIES

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RATIONALE

Taratibu, similar to other areas in Northern Mozambique, has had limited biological surveys. For the last decade, experts have steadily been targeting different sites in northern Mozambique to conduct scientific studies. As a result, it is known that Taratibu is home to at least two species that have not yet been documented elsewhere in the world. The species include one amphibian, *Nothophryne unilurio* (Conradie et al., 2018) and one plant, *Rytigynia torrei* (Burrows et al., 2018). The two species have very restricted range and fall under threatened categories of the IUCN Red List. The amphibian has been assessed as Critically Endangered (CR) and the plant species has been placed in the Endangered (EN) category. Based on the two threatened species, Taratibu qualifies as Key Biodiversity Area. It is highly expected that the KBA status may catalyse mobilisation of resources for Taratibu to ensure the adequate management of the area, which in turn will benefit other biodiversity present at the site, and also in the Qurimbas National Park as a whole.

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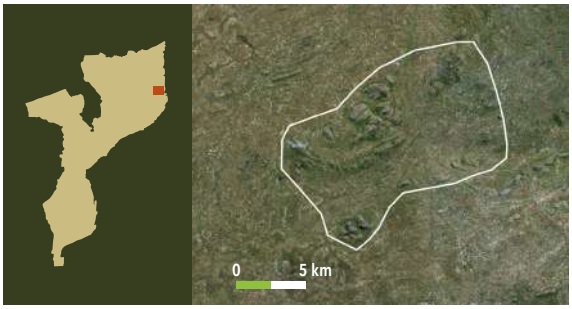
KEY BIODIVERSITY AREAS

ERÁTI

SITE ID: 49147



ADMIN REGION: !Nampula

KBA AREA: !147.83 km²

COORDINATES: -13.87 S, 39.81 E!

CURRENT PROTECTION CATEGORY: N/A

PRE-EXISTING DESIGNATION: N/A

KBA CRITERIA TRIGGERED: A1a, B1

SITE DESCRIPTION

This KBA falls under Eráti District in Nampula Province, Northern Mozambique. The borders of Eráti District include Cabo Delgado Province to the north, Nacaroa District to the south, Memba District to the east and Mecuburi District to the west (MAE, 2014). One of the biggest river systems in the country, Lurio River, runs through and forms the northern boundary with Cabo Delgado Province, and to the south there is the Mecuburi River (MAE,, 2014). The KBA lies within the northern corner of Eráti district covering an area of 147 km². The latitude and longitude midpoint of this KBA is -13.8743 S and 39.81618 E respectively.

The climate of the region is mainly semi-arid and dry sub-humid with an average annual rainfall ranging from 800 to 1,200 mm, but sometimes rainfall can locally exceed 1,500 mm, becoming the sub-humid rainy type climate. Because of its location in relation to the river system, this area is highly influenced by the Mecúburi and Lúrio River valleys. The River valleys are dominated by dark, deep alluvial soils (Fluvisols), heavy to medium texture, moderately to poorly drained, subject to regular flooding. Most soils have medium to heavy texture, being deep, moderately well drained (MAE, 2014). Vegetation in this area is mainly miombo woodland to savannah with thick wooded vegetation patches among the rocky cliffs.

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RATIONALE

The current knowledge on biodiversity of the Eráti District is very limited. However, Eráti is home to at least one plant species (*Allophylus torrei*) which is endemic to Mozambique and has a restricted distribution. *A. torrei*, has been assessed as Endangered under the IUCN Red List of threatened species (Darbyshire et al., 2019). The species is associated with rocky habitats, which likely reduces human access and impactful activities. However, most of the species' range has been heavily impacted, and Eráti seems to be the only site which still holds viable habitat. Because the species is threatened with extinction and it meets the KBA thresholds in this site, Eráti has therefore been classified as Key Biodiversity Area.

It is expected that the KBA status will draw attention of the local and international community in order to mobilize resources to allow further studies in the area.

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KEY BIODIVERSITY AREAS

MATIBANE FOREST RESERVE

SITE ID: 49164

ADMIN REGION: !Nampula

KBA AREA: !109.26 km²

COORDINATES: -14.72 S, 40.79 E

CURRENT PROTECTION CATEGORY: Forest Reserve

PRE-EXISTING DESIGNATION: N/A

KBA CRITERIA TRIGGERED: A1a, B1

SITE DESCRIPTION

The Matibane Forest Reserve (MFR) is located in Mossuril District, situated in North-eastern Mozambique, in Nampula Province (Dudley, N and S. Stolton 2012; Müller et al., 2005). The area is mainly flat but presents some sections that are slightly undulated. The entire reserve is on sandy soils, perhaps of poor nutrients (Dudley, N and S. Stolton 2012; Müller et al., 2005). The MFR was established in 1957 (MICOA, 1997) with the aim of ensuring sustainable harvest of *Androstachys johnsonii* (Mecrusse). Mecrusse, with very hard wood, was found to be a suitable commercial species in construction, particularly for railway, houses and fencing. This species is thought to be dominant in the reserve, followed by *Icuria dunensis*, which is common in some areas.

The main vegetation type in the MFR is dry coastal forest (Dudley, N and S. Stolton 2012; Müller et al., 2005). The core zone of the reserve, comprising about 2,000 to 2,500 hectares, remains in good condition. However, the surrounding buffer zone shows signs of human disturbance including charcoal production, logging, and subsistence agriculture. According to Müller et al., 2005, the core zone has a canopy cover which does not exceed 75%. The main canopy layer species include *Balanites maughanii*, *Afzelia quanzensis*, *Albizia forbesii*, *Albizia glaberrima*, together with *Icuria dunensis* and *Androstachys johnsonii*.

TRIGGER SPECIES

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RATIONALE

The Matibane Forest Reserve holds a significant population of *Icuria dunensis*, which is the KBA trigger species in this site. *Icuria* is regarded as a monospecific genus that is only known to occur in Mozambique (Darbyshire et al., 2019). *Icuria dunensis* is a range restricted species only found in dune forests along the coast in northern Mozambique, covering an Extent of Occurrence (EOO) of nearly 9,354 km^2. This site is also home for another threatened plants species, the *Micklethwaitia carvalhoi* (VU), also endemic to northern Mozambique, which has lost much of its habitat due to deforestation for subsistence agriculture (Burrows et al., 2014)

According to Darbyshire et al. (2019), human pressure has reduced the coastal forests to reach very small sized patches, which are not connected. The Matibane Forest Reserve, which consists mainly of dry coastal forest vegetation type, forms part of the Eastern Africa coastal forests. These extend from Kenya through Tanzania southwards to southern Mozambique. The MFR is within the Zanzibar-Inhambane coastal forest mosaic ecoregion, which has been considered of global importance for conservation. While the coastal forests have been severely fragmented, the MFR remains the largest patch hosting a viable global population size of the endemic Icuria dunensis. Therefore, the Matibane Forest Reserve qualifies as Key Biodiversity Area.

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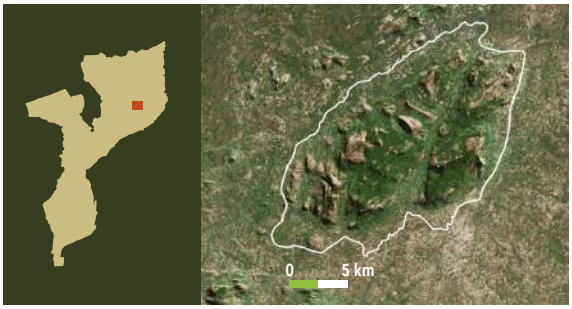
KEY BIODIVERSITY AREAS

MOUNT RIBÀUÉ-MPHALWE

SITE ID: 49167



ADMIN REGION: Nampula

KBA AREA: 264.95 km²

COORDINATES: -13.87 S, 39.81 E

CURRENT PROTECTION CATEGORY: Included in a Forest Reserve

PRE-EXISTING DESIGNATION: N/A

KBA CRITERIA TRIGGERED: A1a, A1b, A1e, B1, B2

SITE DESCRIPTION

The Ribàué-Mphalwe are two adjacent inselbergs which form the Ribàué massif, with a narrow valley running in between (Conrandie et al., 2016). The KBA covers an area of nearly 265 km² and is found in Ribàué District, located at the western side of Nampula Province in Northern Mozambique. At the base of these mountains lays the Ribàué town which has municipality status (MAE, 2014). The areas surrounding Ribàué-Mphalwe are mainly covered by miombo woodland, but with montane forest in the higher areas (at about 500 m altitude), including gallery forests running through the valley. The major water courses are East-West oriented providing a staircase disposition of the relief towards the Indian Ocean. These two peaks are formed by granitic rocks.

The climate in this area is humid tropical (about 65% humidity) presenting two annual seasons, one dry and cold with very limited precipitation, and a rainy and hot season characterized by high precipitation reaching 1,500 mm per annum. This climate experiences strong influence from the medium and high plateau-dominated relief of the continuation of the Chire-Namuli formations (MAE, 2014). Because Ribàué-Mphalwe is situated in an intermediate region between the Lichinga plateaus and the coastal plain of Nampula Province, the area is usually cooler. The temperatures range from 20 ºC to 25 ºC between December and February, which is the warmest period, and 15 ºC to 20 ºC during the dry and cooler months (MAE, 2014).

TRIGGER SPECIES

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RATIONALE

The Ribàué-Mpalue KBA is a Forest Reserve established for protecting water catchments and slopes (FAO, 2008). However, recent biological exploration including for example Conrandie et al. (2016), Tolley et al. (2017), among others, unpublished work has revealed the high biodiversity importance of the Ribauè massif. A total of **15 species have triggered KBA status** at this site, of which 10 are threatened plant species, namely one Critically Endangered (CR) species: *Aloe rulkensii*; five Endangered (EN) species: *Aloe ribauensis*, *Dombeya leachii*, *Memecylon nubigenum*, *Streptocarpus myoporoides*, *Vepris macedoi* and *Plysphaeria ribauensi*; and three Vulnerable (VU) species: *Cynanchum oresbium*, *Plectranthus cucullatus* and *Cissus aristochiifolia*. In addition to the species that have triggered the KBA, there are also two threatened plant species, namely *Rytigynia* sp. C. (CR) and *Stomatostemma pendulina* (VU). These species were excluded from the assessment because there is no updated information on them. *Rytigynia* sp. C. is known from a single herbarium collection from 1964 and *S. pendulina* known from five herbarium collections from 1962 to 1998. Based on current knowledge, all these plant species are endemic to Mozambique and have restricted distribution. Besides plants, the other species that met the KBA criteria at this site include a threatened amphibian *Nothophryne ribauensis* (EN) and 4 reptile species, namely *Rhampholeon tilburyi* (EN), *Dipsadoboa montisilva* (NT) *Lygodactylus ribaue* and *Nadzikambia ribaue*. The latter two species do not yet have their IUCN Red List categories published, because they are new species to science, however, they are also endemic and restricted to this site.

Because the human population have been clearing vegetation around Ribauè massif for subsistence agriculture, the forest has been severely fragmented (Tolley et al., 2017). With ongoing human encroachment, the future of fauna and flora endemic species is highly threatened. The Ribàué-Mpalue is among the highly diverse inselbergs of northern Mozambique such as Chiperone, Inago, Namuli, and Mabu.

This KBA status could potentially draw attention to the site as a conservation priority, nationally and internationally, and lead to measures aimed at reversing current trends in deforestation and forest fragmentation

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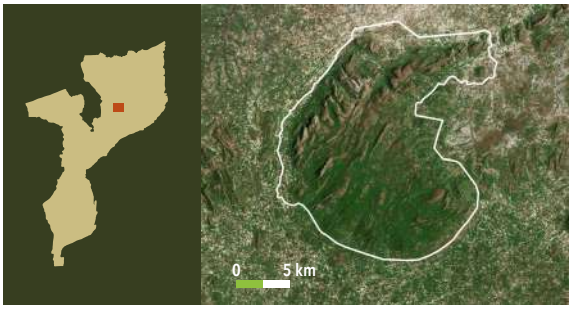
KEY BIODIVERSITY AREAS

MOUNT INAGO

SITE ID: 49163



ADMIN REGION: Nampula

KBA AREA: 326.08 km²

COORDINATES: -15.07 S, 37.39 E

CURRENT PROTECTION CATEGORY: N/A

PRE-EXISTING DESIGNATION: KBA (old criteria), AZE

KBA CRITERIA TRIGGERED: A1a, A1e, B1, B2

SITE DESCRIPTION

Mount Inago is in Malema District, in the western section of Nampula Province, Northern Mozambique. Malema District is bordered by Zambezia Province to the south and Niassa Province to the north (Bayliss et al., 2010). The geology of Mt Inago, which is mainly granite-porphyrite, is very similar to the Namuli massif, due to their close proximity. According to Timberlake et al. (2009), granite-porphyrite encroached the migmatites of the Nampula and Namarroi series around 1,100 – 850 million years ago. The Inago massif elevation ranges from 300–1,870 m, with the main peak reaching 1,804 m altitude. Rainfall in the Malema District shows an average of 1,300 mm per annum. The major vegetation surrounding the mountain is the miombo woodland, particularly up to 1,000 m. From 1,000 to 1,600 m of altitude, the vegetation is mainly forest, with stream valleys covered by riverine forest. Beyond 1,500 m elevation, grasslands and rocky shrublands are also found.

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RATIONALE

Mount Inago forms part of the sky island conservation corridors of northern Mozambique, together with Chiperone, Namuli, Ribauè-Mpalue and Mabu (Tolley et al., 2017). It is home to several species of plants and animals, with current information suggesting that at least 7 endemic species with restricted distributions occur on the mountain. Of these, three are reptiles – the Critically Endangered (CR) Inago Pygmy Chameleon (*Rhampholeon bruessoworum*), and two others which have been submitted to the IUCN for further consideration (*Lygodactylus inago* and *Nadziakambia inago*). In addition, there is one Endangered (EN) amphibian (*Nothophryne inagoensis*); and three species of insect (*Cymothoe baylissi*, *Alaena lamborni* and *Neococenyra bioculata*) which have also been assessed against the IUCN Red List but, have not been published to date. Moreover, there is a potential new freshwater crab (*Potamonautes* sp.), yet to be described. Information on plants is limited, but there is at least one cycad (*Encephalartos* sp.) which does not match with currently known species. Because of the **seven species triggering KBA status**, Inago Mountain is therefore regarded as KBA. This status may potentially draw attention to the site as a conservation priority, both nationally and internationally, and lead to measures aiming to reverse current trends of forest clearing and fragmentation for cultivation.

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KEY BIODIVERSITY AREAS

APAIPS

SITE ID: 6695

ADMIN REGION: Zambezia & Nampula

KBA AREA: 2,506.95 km²

COORDINATES: -21.06 S, 37.89 E

CURRENT PROTECTION CATEGORY: Environmental Protection Area

PRE-EXISTING DESIGNATION: IBA

KBA CRITERIA TRIGGERED: A1a, B1

SITE DESCRIPTION

This KBA is located along the coast of Zambezia and Nampula provinces, in front of the Archipelago of Primeras and Segundas Islands and covers an area of approximately 2,506 km². The southernmost group of islands, considered the Primeiras Islands, lies in the Zambezia province and the northernmost group, the Segundas Islands, lies in the Nampula province, forming an almost continuous archipelago between the cities of Pebane and Angoche in northeastern Mozambique (Salm, 1983; Schleyer & Celliers, 2000). The KBA covers only the coastal/terrestrial part of the existing Environmental Protection Area (APA) at the site, known as Área de Protecção Ambiental das Ihas Primeiras e Segundas (APAIPS), a conservation category in which the sustainable use of resources is allowed. The coastal area is characterized by dune systems, beaches and rare miombo forest. This section is part of the Zanzibar-Inhambane Coastal Forest Mosaic, which has a high biodiversity value (Tabor et al., 2010) and is also home to wetlands and scrubland (Impacto, 2012), with recognized regional importance (Horril, 2001).

The area is characterized by a tropical semi-humid climate with a wet season from mid-November through March and a dry season from April to mid-November. The soils are generally sandy and heaviest in the lowest coastal areas, and they have a reduced water-holding capacity, poor fertility and low cohesion. This makes them prone to erosion, especially once the vegetation has been cleared, and therefore the soils have low-to-moderate potential for agriculture (Impacto, 2012). This KBA includes sand dunes, mangrove forest and terrestrial vegetation such as shrubs and miombo forest.

TRIGGER SPECIES

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MAIN THREATS

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RATIONALE

APAIPS is an important marine biodiversity area, containing one of the most abundant and diverse hard and soft coral communities in Mozambique, extensive seagrass beds, intact mangrove forests covering eight species of mangroves, and a deep cold water upwelling rich in nutrients that supports the local important fisheries (Salm, 1983; Schleyer & Celliers, 2000, Pereira & Videira, 2007). Being within the Zanzibar-Inhambane biogeographical region, the Primeiras and Segundas Islands are also important for terrestrial biodiversity. The Zanzibar-Inhambane coastal forest mosaic is home to over 4,500 plant species including 1,050 plant genera, of which more than 1,300 are endemic plant species and at least 33 are endemic plant genera (Tabor et al., 2010).

It was through the exceptional flora elements existing in the coastal part of the APAIPS, that KBA status was triggered. The site is home to a significant population of *Icuria dunensis*, a strict endemic plant species to Mozambique (Darbyshire et al., 2019), which has been assessed as Endangered by the IUCN Red List of threatened species. Alves et al. (2014) and Darbyshire et al. (2019) have suggested that this area is thought to hold one of the two subpopulations for *Brachystegia oblonga*, a Critically Endangered species, and *Acanthaceae Blepharis dunensis*, an Endangered species for which the last record was just over 50 years ago. Both species are endemic to Mozambique, but it is highly likely that the *Brachystegia oblonga* subpopulation in this area may have gone extinct as a result of habitat loss.

Given the overall biodiversity importance of the site and the occurrence of a significant population of *Icuria dunensis*, APAIPS qualifies as a Key Biodiversity Area, which highlights its importance in contributing to the persistence of global biodiversity.

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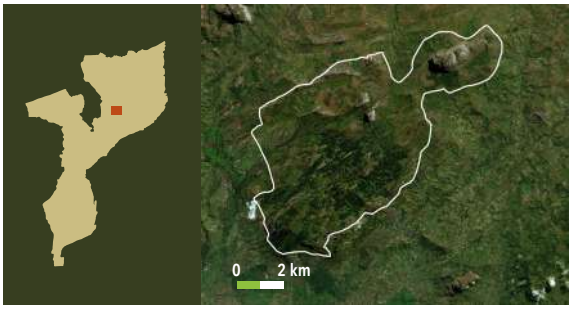
KEY BIODIVERSITY AREAS

MOUNT NAMULI

SITE ID: 6693



ADMIN REGION: Zambezia

KBA AREA: 52.64 km²

COORDINATES: -15.39 S, 37.02 E

CURRENT PROTECTION CATEGORY: N/A

PRE-EXISTING DESIGNATION: KBA (old criteria), IBA, AZE

KBA CRITERIA TRIGGERED: A1a, A1b, A1e, B1, B2

SITE DESCRIPTION

Mount Namuli KBA covers an area of about 52 km² in Gurué district of Zambézia province, central-northern Mozambique. At 2,419 meters altitude, Mt Namuli is the second highest point in the country, and the Namuli complex forms part of the watershed between the Rio Lúrio and Rio Licungo catchments. It is essentially a complex of granitic inselbergs or intrusions linked by a high plateau, exposed by millions of years of subsequent erosion and it is entirely covered by lithic soils (Timberlake et al., 2009).

The annual average precipitation is about 1,995.7 mm, with annual average evapotranspiration of 1,226.7 mm. The annual average temperature is 21.9 ºC, the highest in November (32.5 ºC) and the lowest in July (12.3 ºC). According to Timberlake (2009) the vegetation of the Namuli massif above 1,200 m altitude can be broadly categorized into six main groups – forest, woodland, scrub, grassland, thin mats or patches on rocky slopes, and cultivated/heavily disturbed areas. Being Mozambique's second highest peak, Namuli presents a beautiful landscape, yet its real value is its unique flora and fauna, and the ecosystem services it provides to the estimated at 8,000-12,000 people residing on the mountain, as well as those served by Namuli's waters far beyond the massif itself (Legado & Lupa, 2017).

MAIN THREATS

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TRIGGER SPECIES

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WWF Mozambique – Confidential – L Q J

RATIONALE

Mount Namuli falls within the Eastern Afromontane Biodiversity Hotspot (Legado & Lupa, 2017). Namuli's combination of geography and geology has led to the development of diverse habitats, many of which are now rare in the region. Of interest are several types of forest, grasslands and sheer rock faces that are home to several species, either endemic or threatened with extinction or both (Legado & Lupa, 2017). Given the high biodiversity importance and uniqueness, Namuli was designated as a Key Biodiversity Area in 2012, through the Critical Ecosystem Partnership Fund (CEPF) and is among the highest-level conservation priority within the region, based on an analysis of irreplaceability and vulnerability (Legado & Lupa, 2017). Namuli has also been designated an Important Bird Area (Parker, 2001), an Important Plant Area, and an Alliance for Zero Extinction site. All these designations highlight the mountain's importance for biodiversity for Mozambique and globally. During this assessment, **30 species** across plants, butterfies, amphibians, reptiles, **birds and mammals' taxonomic groups have met the KBA thresholds**, of which 16 are endemics. These include Vincent's Bush Squirrel (*Paraxerus vincenti*), the Namuli Apalis (*Apalis lynesi*), the Namúli Mongrel Frog (*Nothophryne baylissi*), three chameleons (*Nadzikambia namuli*, *Rhampholeon namuli*, *Rhampholeon tilburyi*), one snake (*Atheris mabuensis*), one butterfly (*Iolaus (Epamera) malaikae*) and 9 endemic plants.

Although its ecological and biological importance has been recognized for many years, the area is not formally protected (Legado & Lupa, 2017; Timberlake et al., 2009). It is one of only a few priority areas identified as requiring formal protection in Mozambique's National Biodiversity Strategy and Action Plan (2015 – 2035). The wider landscape surrounding Mount Namuli is largely community land that is heavily populated and intensively cultivated (Legado & Lupa, 2017). Subsistence agriculture is the main livelihood activity for the resident communities. In recent decades, increasing numbers of farmers have started to open fields in the high elevation plateau forests, driven mainly by growing human population coupled with declining soil fertility and crop yields in the lower landscape (Legado & Lupa, 2017). Based on a recent conservation legislation in Mozambique, which allows establishment of Community Conservation Areas, it has been believed that this model would be the way forward to safeguard Namuli's unique biodiversity but, allowing the community to yield benefits from the Mountain. Therefore, acknowledging the presence of additional KBA trigger elements, strengthens the KBA status of the Mount Namuli, which in turn may call further attention of the conservation community in the country as well as internationally to address the Mount Namuli for formal protection.

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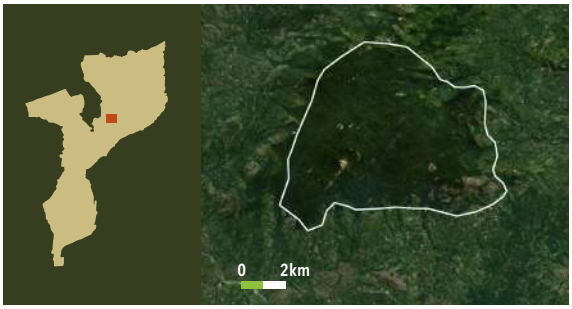
KEY BIODIVERSITY AREAS

MOUNT MABU

SITE ID: 24261



ADMIN REGION: Zambezia

KBA AREA: 60.89 km²

COORDINATES: -16.28 S, 36.36 E

CURRENT PROTECTION CATEGORY: N/A

PRE-EXISTING DESIGNATION: KBA (old criteria), IBA

KBA CRITERIA TRIGGERED: A1a, A1b, B1, B2

SITE DESCRIPTION

This KBA encompasses Mount Mabu, central Mozambique and covers an area of about 60.9 km². Mount Mabu, a granitic massif rising to 1,700 m altitude, is in Lugela District, Zambezia Province right north of the Lugela River. In relation to other important inselbergs in the region, Mabu is about 95 km south-east of Mulanje Mountain in Southern Malawi, and about 120 km south-west of Mt Namuli (Timberlake et al., 2012; Timberlake and Bayliss, 2016). According to Timberlake et al. (2012), the Mabu massif is substantially smaller than the Namuli complex and it does not include any significant area of upland plateau. The rock forming the Mabu massif is syenite, like granite, an igneous intrusion of the younger Precambrian Namarroi series dating back from 850-100 Mya (Timberlake et al., 2012).

Mean annual rainfall is 2,119.1 mm, ranging from a monthly mean of 34.2 mm in September to 362.3 mm in January (Timberlake & Bayliss, 2016). Mean annual temperature is 23.7 ºC, ranging from 21 ºC in July to 25.5ºC in October. During cooler winter months potential evapotranspiration is roughly equivalent to rainfall, but in October it is more than three times monthly rainfall (Timberlake & Bayliss, 2016). With respect to vegetation, all studies on Mount Mabu have showed that the area of moist forest is very extensive for the region (between 5,500 and 7,900 ha), with the great majority of it being found between 1,000 and 1,400 m. Such mid-altitude forest type is increasingly rare in the Southern African region as these areas have often been cleared in the past 100 years for timber and agriculture.

TRIGGER SPECIES

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MAIN THREATS

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RATIONALE

Mount Mabu is already a KBA according to old criteria. Timberlake & Bayliss (2016) state that several studies across different taxonomic groups have been carried out over time that show the unique biodiversity of this site. This includes birds (Spottiswoode et al., 2008; Dowsett-Lemaire, 2010), reptiles (Branch & Bayliss, 2009: Branch & Tolley, 2010; Branch, Bayliss & Tolley, 2014), butterflies (Congdon, Collins & Bayliss, 2010), bats (Curran & Kopp, 2009; Monadjem et al., 2010; Taylor et al., 2012), freshwater crabs (Daniels & Bayliss, 2012), and plants (Harris, Darbyshire & Polhill, 2011), proving the biodiversity richness of this site. During this assessment, 17 species across plants, butterflies, **amphibians, reptiles and birds** taxonomic groups have met the KBA thresholds. This includes five endemic reptiles (two snakes, two chameleons and one lizard), one endemic butterfly and three endemic plants. In general, the threats are minimum to Mabu but habitat destruction, resulting mainly from small scale farming and fire, has been documented as being the main threat. Given the uniqueness of this site, it is required that some measures be put in place to prevent expansion of the threats occurring in the surrounding areas. The main recommendation given by Timberlake & Bayliss (2016) as part of their consultancy work to the Forest Fund International is that the main Mount Mabu massif area deserve formal protection status. This recommendation was built in recognition that Mount Mabu's forests and biodiversity are unique, and include a number of species found nowhere else. Aligned with this, considerable international attention was given to the discovery of the forest and associated biodiversity of Mt Mabu in late 2008 and 2009. Following the international attention many calls have been made for its conservation, but it is still not under any form of formal protection (Timberlake & Bayliss, 2016). Acknowledging the presence of additional KBA trigger elements, reinforce the KBA status of Mount Mabu which in turn may call attention of the conservation bodies in the country and internationally to address the need for formal conservation in Mount Mabu.

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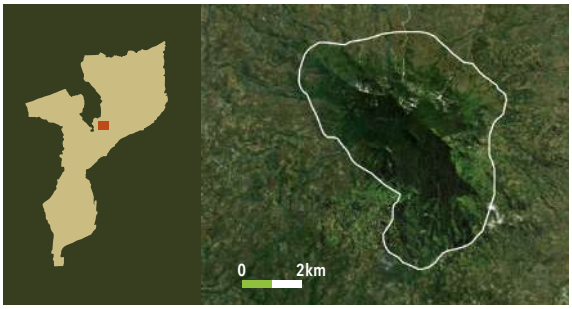
KEY BIODIVERSITY AREAS

MOUNT CHIPERONE

SITE ID: 6694



ADMIN REGION: Zambezia

KBA AREA: 35.97 km²

COORDINATES: -16.48 S, 32.572 E

CURRENT PROTECTION CATEGORY: N/A

PRE-EXISTING DESIGNATION: KBA (old criteria), IBA

KBA CRITERIA TRIGGERED: A1b, B1, B2

SITE DESCRIPTION

The KBA falls on the Mount Chiperone in Northern Mozambique and covers an area of about 35.97 km². The Mount Chiperone is a semi-isolated peak located about 50 km south of the Mount Mulanje massif in Southern Malawi (Timberlake et al., 2007). It lies 40 km south of the frontier town of Milange district in Zambezia Province. The central point of the massif is 16° 29'S, 35° 43'E, with the highest point at 2,054 m (c. 16° 28'44"S, 35° 42'88"E) (Jonathan et al., 2007). The mountain's geology consists of recent syenite (Jurassic/Cretaceous period, about 150 Million years ago) (Timberlake et al., 2007). The region is influenced by the tropical rainy savanna climate with an average annual rainfall varying mostly between 1,200 and 1,400mm. The rainy period is between November and the end of March which overlaps with the hot season (MAE, 2014). The temperature annual average ranges from 24 ºC to 26 ºC and the Potential evapotranspiration registers average values which range from 1,000 to 1,400 mm (MAE, 2014). According to Timberlake et al. (2007) Mount Chiperone is covered with medium and higher altitude forest above about 1,000 m. Below that altitude together with the ridges with shallow soils, there is miombo or similar woodland types. The topography on the mid-slopes is very dissected and often steep, hence soils are shallow (Timberlake et al., 2007). The lower slopes of the mount originally supported a drier miombo woodland with *Brachystegia spiciformis*, *B. boehmii*, *B. utilis* and *Julbernardia globiflora*, but much of this has been cleared for agriculture on the southern and eastern slopes. Burning of the remaining woodland is common. Fallow areas are often colonized by the bamboo *Oxytenanthera abyssinica* and secondary woodland (Timberlake et al., 2007).

TRIGGER SPECIES

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MAIN THREATS

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RATIONALE

Mount Chiperone, together with Mabu and Namuli, is regarded as an important link between the Eastern Arc Mountains and the East African Coastal Forest (Conradie et al., 2016). Mount Chiperone is already a KBA and is also recognised as an Important Bird Area (MZ 010) by Parker (2001). However, Timberlake et al. (2007) noted impacts on the edges due to clearing and burning for subsistence farming but, most of the forest was not under direct impact from anthropogenic effects. It is argued (Timberlake et al., 2007) that spiritual beliefs from the local population had provided a degree of protection to the forest. However, about a decade later, Langa et al. (2016) described that the tradition beliefs to access areas in Mount Chiperone were not credited anymore. The beliefs are now less valid because of the need of agriculture expansion given the reduction in resources on the low-lying areas. Therefore, the communities have reduced a considerable part of forested areas that are interconnected. The process of opening agriculture patches reduces the area covered by the forest resulting in open fields, which easily become eroded by rain. Besides this main influence on the mount degradation, other activities such as forest extraction, hunting and fishing also exert pressure on the conservation of resources on Mount Chiperone (Langa et al., 2016).

Because more data across different taxonomic groups is being accumulated over time (e.g. Conradie et al., 2016; Bittencourt-Silva, 2017), there is a pressing need to reinstate the biological importance of the Mount Chiperone. It is home to rare, range restricted and threatened reptile species including *Rhampholeon nebulauctor* (under Vulnerable category of the IUCN Red List), *Nadzikambia chiperone*, and *Lygodactylus chiperone*, which are only known from Chiperone and are new to science (Conradie pers.com). It also hosts a significant population of *Chamaetylas choloensis* (VU). Acknowledging the presence of additional KBA trigger elements enhances the existing KBA status of Mount Chiperone, which in turn may raise the attention of conservation entities in the country as well as internationally to promote Mount Chiperone's formal protection.

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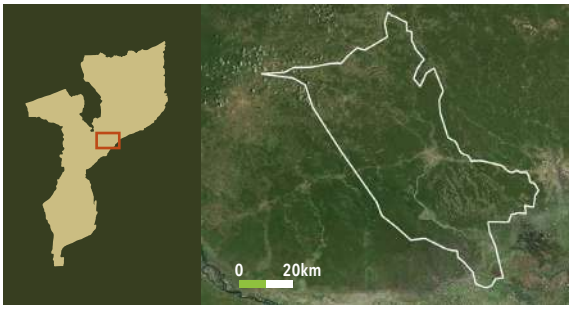
KEY BIODIVERSITY AREAS

DERRE FOREST RESERVE

SITE ID: 49165



ADMIN REGION: Zambezia

KBA AREA: 3,984.3 km²

COORDINATES: -22.04 S, 34.9 E

CURRENT PROTECTION CATEGORY: Partial inclusion in Forest Reserve

PRE-EXISTING DESIGNATION: N/A

KBA CRITERIA TRIGGERED: A1b, B1

SITE DESCRIPTION

This KBA covers an area of about 3,984 km², and falls on Derre Forest Reserve (DFR), which runs through three Districts including Derre, Murrumbala and Mopeia district, all in Zambezia province, Central Mozambique. The KBA follows the existing boundaries of DFR in the northwest part (under the Murrumbala and Derre districts) and extends to the southeast, covering most of the district of Mopeia. According to the Köppen climate classification, the region is dominated by tropical rainy savannah climate. The average annual temperature is about 23°C, with maximum and minimum averages of 29 °C and 17 °C, respectively (MAE, 2005). The monthly average rainfall is 1,017mm, with January being the wettest month (MAE, 2005). Geomorphologically, the region is dominated by a plateau with an altitude above 400 m. This site is mostly of alluvial clay soils (MITADER, 2015 b) and there are several rivers running through including Chire, Luala, Luamba, Muelide, Missongue, Thambe, Luó , Bualizo and among others, with the Chire River standing out for its importance (MEF & MITADER, 2015a). In terms of vegetation, the northwest section is dominated by Miombo forests, with mostly deciduous species, where Brachystegia spp. and Julbemardia paniculata are the dominant species. There are also dry forests, woods and acacia scrub, swamps, alluvial zones, sandbanks/islands and riverine forests along the main lines of water (MEF & MITADER, 2015a). The vegetation in the southeast is also quite diverse and has different types of habitats which form more or less continuous patches of vegetation (MEF & MITADER, 2015b). The species that gave the status of a Forest Reserve (*Swartzia madagascariensis* and *Pterocarpus angolensis*) are recovering after years of illegal logging, now represented in the young cohort.

TRIGGER SPECIES

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RATIONALE

This KBA covers the already protected Derre Forest Reserve in the North, while the southern limit of the proposed KBA is completely unprotected, and thus experiences high pressure from local communities. This is because communities in the area rely mainly on shifting subsistence agriculture which leads to clearing of new areas to grow food. Often, the new areas are burnt after clearing, resulting in the occurrence of uncontrolled fires (MEF and MITADER, 2015a; b). Despite these challenges, Derre Forest Reserve together with nearby areas still hold exceptional biodiversity. About 670 flora species are likely to occur at this site, including many endemic and near-endemic species to Mozambique. In addition, many fauna species of conservation concern have been recorded, particularly birds such as *Acrocephalus griseldis* (EN), *Ardeola idea* (EN), *Balearica regulorum* (EN), *Bucorvus leadbeateri* (VU), *Gyps africanus* (EN), *Polemaetus bellicosus* (VU), *Sagittarius serpentarius* (VU) and *Trigonoceps occipitalis* (CR) (MEF and MITADER, 2015a; b). The proposed KBA also holds important mammal species such as *Lycaon pictus* (EN), *Hippopotamus amphibius* (VU), and *Smutsia temminckii* (VU) (MEF and MITADER, 2015a; b). Of the threatened biodiversity elements in Derre Forest Reserve, there are at least **two KBA trigger species**. These include *Nothobranchius krysanovi* (VU), a freshwater fish species with a narrow distribution range experiencing ongoing degradation due to human activities (Nagy and Watters, 2019), and *Tarenna longipedicellata* (VU), a lowland forest plant, which is being impacted by a range of human activities including expansion of subsistence agriculture, settlement, logging, and excessive burning (Darbyshire et al., 2019).

Given the overall importance of biodiversity at the site and the presence of species that have triggered KBA criteria, it is strongly believed that the KBA status will be highly beneficial to the site, and further highlights its contribution to the persistence of global biodiversity.

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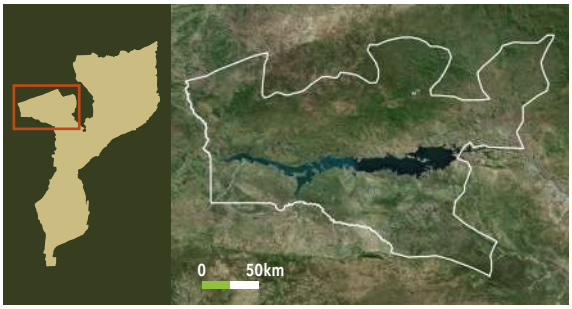
KEY BIODIVERSITY AREAS

TCHUMA TCHATO

SITE ID: 49171



ADMIN REGION: Tete

KBA AREA: 38,175.43 km²

COORDINATES: -15.68 S, 31.46 E

CURRENT PROTECTION CATEGORY: Community Conservation Area, National Park

PRE-EXISTING DESIGNATION: IBA

KBA CRITERIA TRIGGERED: A1a, A1b, A1c, A1d

SITE DESCRIPTION

This KBA covers Tchuma Tchato, the first and largest Community Conservation Area in Mozambique, and the Magoé National Park both located in Tete province (Filimão et al., 2000). This is where Mozambique's largest artificial lake, Cahora Bassa, is also located. The region, is characterized by a prominent Jurassic basalt outcrop to the southeast, known as "the Luia dome" and covers part of the Zambezi valley, which consists mainly of Cretaceous and Karoo sediments, predominantly sandstones (Cunliffe, 2002).

The climate is strongly seasonal, being dominated by a long dry season from May to November (Cunliffe, 2002). Annual rainfall is dependent on altitude, varying from about 600-800 mm at the valley area, to about 1,000-1,200 mm in the northern plateau area (Cunliffe, 2002). Mean annual temperatures are relatively high within the valley, with some average summer temperatures above 32 °C, but is milder on the plateau (Brown, 1998). The valley environment is thus strongly semi-arid, with moisture being the major limiting factor for plant growth, whilst conditions on the plateau are considerably more mesic (Cunliffe, 2002). The predominant vegetation in the region is Acacia and Mopane Savannah. Narrow bands of flood-plain vegetation occur along the Zambezi and the Lake shores and along other major rivers such as the Mpanhame and Musengezi (Brown, 1998). Tourism is the basic source of revenue for operationalization of the Tchuma Tchato program and, it is stimulating socio-economic, cultural, and environmental development, job promotion, infrastructure development and communication at the local level (MITADER, 2017).

TRIGGER SPECIES

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MAIN THREATS

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RATIONALE

Tchuma Tchato community conservation area has been identified as containing some of the most abundant wildlife populations in Mozambique (Brown, 1998). It is home to several species of conservation concern, including a large population of *Loxodonta Africana* (EN). Due to poaching the number of elephants has been halved since 2010, which raises a great concern for this species. In addition, this site also holds important populations of some threatened carnivores such as lion (*Panthera leo*, VU), leopard (*Panthera pardus*, VU) (Jacobson et al., 2013) and African wild dog (*Lycaon pictus*, EN) (RWCP and IUCN/SSC, 2015). This site is also relatively rich in birdlife, and the southwest area (Headwaters of the Cahora Bassa Dam) was recognized as an Important Bird Area (IBA-MZ013, Parker, 2001) due to the occurrence of three species of the Zambezian biome (*Falco dickinsoni*, *Agapornis lilianae* and *Lamprotornis mevesii*). This assessment identifies **at least two species that met the KBA thresholds** namely: hippopotamus (*Hippopotamus amphibious*, VU) and Kariba Tilapia (*Oreochromis mortimeri*, CR). According to ANAC (2017), the Cahora Bassa area holds the largest hippopotamus population in Mozambique, with an estimate of about 4,420 individuals, which represent about 3% of its global population size. Kariba tilapia is facing rapid declines in Lake Kariba and the Zambezi River, and it is being replaced by an exotic species *Oreochromis niloticus*. The rate of decline was at least 80% over the last 10 years (Marshall and Tweddle, 2007). This KBA is already protected through the Tchuma Tchato Community based natural resource management (CBNRM) area, and the Magoe National Park. In general, the wildlife and tourism activities in the site appear to offer a more sustainable form of land use than agriculture, at least for the lower lying, more arid valley areas. However, there is a danger that the agricultural expansion and associated development activities may rapidly erode biodiversity and tourism resources, and therefore compromise future biodiversity-based development options. The KBA status highlights the importance of this site in contributing to the persistence of global biodiversity. It is strongly believed that this KBA status will be highly beneficial to the area and may attract further attention from the conservation community in the country, as well as internationally, to strengthen conservation activities in the area.

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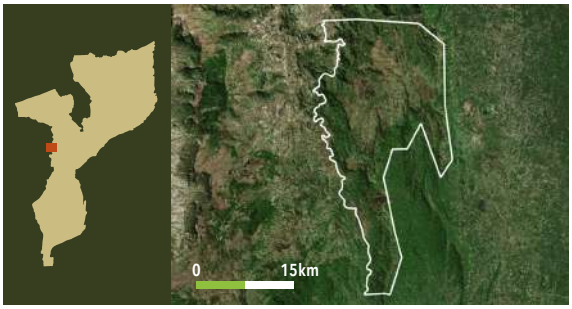
KEY BIODIVERSITY AREAS

SERRA CHOA

SITE ID: 49169



ADMIN REGION: !Manica

KBA AREA: !515.75 km²

COORDINATES: -22.59 S, 31.87 E

CURRENT PROTECTION CATEGORY: N/A

PRE-EXISTING DESIGNATION: N/A

KBA CRITERIA TRIGGERED: A1b

SITE DESCRIPTION

This KBA falls on Serra Choa (Choa Mountains), which are situated at the northern end of the eastern highlands in Manica Province, western-central Mozambique (Cizek, 2009 and MAE, 2005).The eastern slope of the Choa mountains rises steeply from the surrounding plateau, forming a 20 km long escarpment which runs on a north-south axis to the northwest of Catandica (Cizek, 2009). Only small areas of the range exceed 1500 m elevation, and the highest point is over 1,800 m (Cizek, 2009).

According to the Köppen climate classification, the Choa Mountains have a tropical humid climate (MAE, 2005). The rainy season is mainly between November and April, and the rain varies significantly in quantity and distribution, from 1000 to 1,400 mm in the plateau region, and from 1,300 to 1,700 mm in the mountainous region (MAE, 2005). The eastern slopes of Choa Mountains intercept the moist air that moves in from the Mozambique Channel (Indian Ocean) across the Manica Platform, where it meets the highlands and is forced to rise, creating orographic rainfall (Cizek, 2009). This rainfall sustains lush montane grasslands with pockets of montane evergreen forest at higher elevations, with lower altitude areas mainly vegetated by miombo woodland (Cizek, 2009). In terms of hydrology, the western slopes of the mountains are drained by the Gairezi River, which flows northwards towards the Zambezi River from its source in the Nyanga Mountains. The eastern slopes of the mountains are drained by the Nhazonia River (also known as the Nyadzonya River), a tributary of the Pungwe River (Cizek, 2009; MAE, 2005).

TRIGGER SPECIES

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MAIN THREATS

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RATIONALE

Serra Choa is regarded as an important site for birds and is home to the blue swallow (*Hirundo atrocaerulea)*, a Vulnerable species under the IUCN Red List of threatened species. The Mozambique and Malawi Blue Swallow survey (Little, 2013), estimated a total of 10-15 breeding pairs of blue swallows at this site, representing about 2% of their global mature population, estimated to be between 1,000-1,499 mature individuals (IUCN,2019). In addition, the surveys on Birds of the Serra Choa by Cizek (2009), recorded over 70 bird species at this site, including new records for Mozambique and new localities for eastern Highlands endemic birds. However, according to Little (2013) this site is largely disturbed with human habitation, crop agriculture, macadamia nut orchards and cattle grazing along with frequent intensive burning. There is, therefore, a pressing need to revert the current scenario in order to ensure biodiversity persistence. It is strongly believed that the KBA status will bring national and international attention regarding the conservation of this site, in order to ensure the persistence of the blue swallow and many other bird species that occur significantly at this site.

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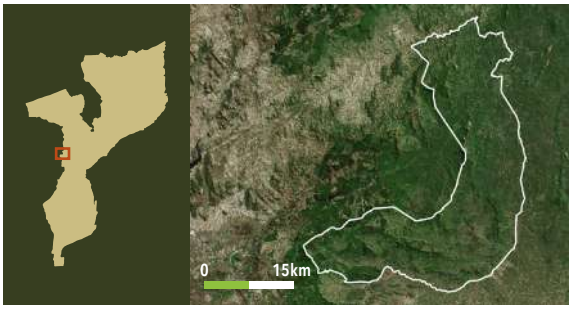
KEY BIODIVERSITY AREAS

MACHIPANDA

SITE ID: 49151



ADMIN REGION: !Manica

KBA AREA: !756.30 km²

COORDINATES: -18.74 S, 32.98 E

CURRENT PROTECTION CATEGORY: N/A

PRE-EXISTING DESIGNATION: N/A

KBA CRITERIA TRIGGERED: A1b

SITE DESCRIPTION

This KBA covers an area of about 756 km² and falls under Machipanda administrative post, in Manica District, one of 9 districts of Manica Province, central Mozambique. The site is in the west of Manica district, with an elongated and narrow shape, the western boundary is the Republic of Zimbabwe.

The climate in this region according to the Köppen climate classification is wet temperate type with annual average rainfall in the order of 1,000 and 1,200 mm. In the region there are two very distinct seasons, the rainy season and the dry season. The rainy season which occurs from November to April and the cold and dry season from May to September. The annual average temperature is 21.2 oC (Tuzine et al., 2011; MAE, 2014). Vegetation in the site is mainly miombo alongside with grasslands or wooded grassland (MAE, 2014). The western part that borders the Republic of Zimbabwe is characterized by mountain ranges that extend from south to north. This formation comprises basalts, rhyolites and alkaline lavas. Most outcrops form ridges and mountain ranges that reach an altitude of 1,500 to 2,000 m (MAE, 2014). The Manica region is drained by the Revuè River and its tributaries, itself a tributary of the Búzi River, which is the main hydrographic basin.

TRIGGER SPECIES

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MAIN THREATS

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RATIONALE

Current knowledge on biodiversity of the Machipanda site is very limited. It is known, however, that Machipanda is a breeding site of the blue swallow *Hirundo atrocaerulea*, listed by the IUCN as Vulnerable, and it holds a significant proportion of their global population. The Mozambique and Malawi Blue Swallow survey (Little, 2013) counted a total of 43 blue swallows at this site, the highest record in Mozambique, with a population estimate of 25-30 pairs representing about 4% of their global population estimated in 1,000-1,499 mature individuals (IUCN, 2019). This site is also home to a mole assessed as Vulnerable under the IUCN Red List of threatened species, the Arend's Golden Mole, *Carpitalpa arendsi* (VU) (Bronner, 2015). With a restricted distribution, it is closely associated with remaining patches of montane grasslands and indigenous forests, which have shrunk as a result of human activities (Bronner, 2015). Habitat modifications are thus inferred to be major potential threats to the survival of this species, given its restricted range (Bronner, 2015). Based on the distribution range, this site is estimated to support about 4 % of its global population.

According to Little (2013), the blue swallow populations are at risk of further decline if both their breeding and non-breeding habitats cannot be secured. Loss of suitable habitat is the primary listed cause of blue swallow population decline. Approximately 47% of the non-breeding habitat is not under any formal protection (Evans & Bouwman, 2009). Therefore, it is very important to secure this site in order for this biodiversity to persist in time. This KBA status could capture the attention of the national and international conservation entities, which in turn, could implement measures to ensure the global persistence of blue swallow and Arend's golden mole.

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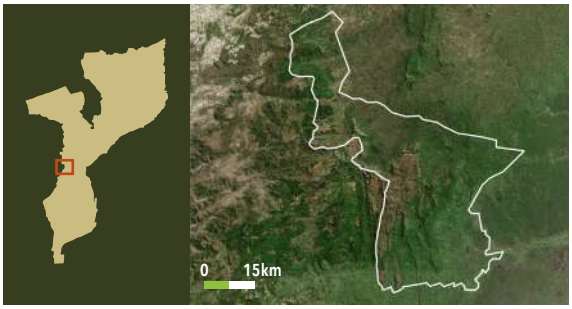
KEY BIODIVERSITY AREAS

CHIMANIMANI

SITE ID: 6690



ADMIN REGION: Manica

KBA AREA: 2,370.62 km² **COORDINATES:** -24.73 S, 32.02 E

CURRENT PROTECTION CATEGORY: Includes a National Park, Buffer Zone, Forest Reserves

PRE-EXISTING DESIGNATION: KBA (old criteria), IBA, AZE

KBA CRITERIA TRIGGERED: A1a, A1b, A1e, B1

SITE DESCRIPTION

This KBA encompasses all the Chimanimani National Park-CNP (formerly known as Chimanimani National Reserve-CNR), including its buffer zone and covers an area of about 2,370 km². This site includes the well-known Chimanimani mountains that lie on the border between Mozambique and Zimbabwe, with most of the range (perhaps three-quarters) lying within Mozambique (Timberlake et al., 2016; Timberlake, 2017). The highland area covers about 530 km² and ranges in altitude from around 500 m in the south to the highest peak of Mt Binga at 2,436 m, which is the highest point of Mozambique (Timberlake et al., 2016; da Costa and Tovela, 2018). Most of the main plateau lies at around 1,000 to 1,800 m. The mountains are protected on both sides of the border, and together form part of a Trans-Frontier Conservation Area (TFCA) (Timberlake et al., 2016; Timberlake, 2017). In terms of hydrology, the CNP area is lying in the Búzi River basin and is ranging between Mussapa Pequena River and Lucite River, limits north and south, respectively. The eastern border is the Mussapa River flowing southwards until its confluence with the Lucite River. The southern and central mountains are drained by the Lucite and Mussapa rivers, the northern mountains are flowing northward into the Revue River, tributary of Búzi River (da Costa and Tovela, 2018). The main vegetation types recorded on Chimanimani mountains are: Forest (Dry montane forest and Marginal forest); Woodlands (miombo); Scrub (Ericaceous scrub and Predaceous scrub); Grassland; Aquatic communities and Lithophytic communities (Timberlake et al., 2016)

MAIN THREATS

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TRIGGER SPECIES

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RATIONALE

This site is known for exceptional levels of plant endemism (more than 75 endemic species) and has already been recognized as an important area for plant biodiversity for at least 50 years (Timberlake et al., 2016). In addition, the mountains have been recognised as one of the main Key Biodiversity Area (KBAs) in the Eastern Afromontane Hotspot (CEPF, 2012), and as an Important Bird Area (IBAs) (Parker, 2001). All these designations serve to highlight the mountain's importance for biodiversity, not only for Mozambique but globally. During this assessment based on current information, 41 species across plants, butterflies, **amphibians, reptiles and mammals' taxonomic groups have met the KBA criteria** for this site. The KBA was triggered by 34 plant species, 33 of which are threatened with extinction, as well as 2 species of butterflies, 2 amphibians, 2 reptiles and 1 mammal. Additionally, this site holds many other threatened species, particularly birds. It is also possible to find African elephants and several species that have been tentatively identified as new to science (Naskrecki, 2018). In terms of fish, this site holds endemic species, including several additional species which present wider distributional ranges but still endemic to Búzi and Pungwe rivers. Despite this site being already protected, it faces various ecological threats. This assessment shows that this site is contributing significantly for global persistence of biodiversity, therefore deserves recognition as a Key Biodiversity Area.

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KEY BIODIVERSITY AREAS

GORONGOSA-MARROMEU

SITE ID: 49160

ADMIN REGION: Sofala

KBA AREA: 23,087.9 km² **COORDINATES:** -23.22 S, 33.77 E

CURRENT PROTECTION CATEGORY: National Park, Buffer Zone, National Reserve, Hunting Area and Forest Reserves

PRE-EXISTING DESIGNATION: KBA (old criteria), IBA, Ramsar

KBA CRITERIA TRIGGERED: A1a, A1b, A1c, A1d, A1e, B1

SITE DESCRIPTION

This KBA comprises Gorongosa National Park (GNP) and buffer zone in the West, and the Marromeu Complex in the East. Within GNP is Gorongosa Mountain (also called "Serra da Gorongosa"), perched on the midlands of the Rift Valley complex, extending down from Ethiopia through Kenya and Tanzania. It is an isolated massif about 30 km (N-S) long and 20 km (E-W) wide. The highest point is the Gogogo peak with 1,863 m above sea level. (Vogier, 2009; Stalmans and Beilfuss, 2008). The Marromeu Complex covers the southern half of the Zambezi delta, including existing forest reserves, hunting concessions, agricultural land and community lands (Beilfuss et al., 2010; Beilfuss,2015). The climate in this region varies with altitude (Vogier, 2009). In general, the region is under a tropical savanna climate, except for Gorongosa mountain which has a warm rainy climate (Vogier, 2009). Within the GNP area, the seasonal flooding and waterlogging of the valley composed of a mosaic of different soil types creates a variety of distinct ecosystems (Parque Nacional da Gorongosa, 2010). Grasslands are dotted with patches of *Acacia*, savanna and dry forest. The plateaus contain miombo forest (Parque Nacional da Gorongosa, 2010). The Gorongosa Mountain consists of *Brachystegia* woodland on the lower slopes, dense evergreen forest at altitudes between 1,200m and 1,500m, and montane grassland at the summit, with forest patches in the ravines (Müller et al., 2012). The Marromeu Complex is part of the Lower Zambezi Freshwater Ecoregion and includes a mosaic of wetland communities grading from acacia and palm savanna at the floodplain periphery to seasonally flooded grassland, papyrus swamps, evergreen forests, and open water bodies on the low-lying plains to mangrove forest and mudflats bordered by dunes near the coast (Beilfuss et al., 2010; Beilfuss, 2015).

TRIGGER SPECIES

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MAIN THREATS

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RATIONALE

This site is ecologically unique, with high species diversity and environmental features found nowhere else in sub-Saharan Africa (Parque Nacional da Gorongosa, 2010). The Gorongosa Mountains and Gorongosa National Park already have Key Biodiversity Area (KBA) status and have already been recognized by Parker (2001), together with the Marromeu Complex (Zambeze Delta), as an Important Bird Area (IBA). Because of its considerable ecological and socio-economic values, the Marromeu Complex is among the most important wetlands in Africa (Beilfuss, 2015). The boundaries of this KBA considers a proposed wildlife corridor connecting the Gorongosa National Park to the Marromeu Complex through hunting "coutadas", which will facilitate wildlife movement. During the present assessment, at least **21 species among mammals, birds, reptiles,** freshwater fsh, butterfies and plants taxonomic **groups met the KBA criteria** for this site. In addition to these 21 KBA trigger species, this site is also home to many other species of conservation concern, particularly mammals such as: *Panthera pardus* (VU), *Smutsia temminckii* (VU) and other threatened birds such as: *Torgos tracheliotos* (EN), *Swynnertonia swynnertoni* (VU) and probably *Hirundo atrocaerulea* (VU). Additionally, this site supports the densest concentration of waterbirds in Mozambique and the largest breeding colonies of Great White Pelican (*Pelecanus onocrotalus*) in southern Africa (Beilfuss et al., 2010). Furthermore, new species have been recently recorded and described at this site, including a freshwater crab (*Potamonautes gorongosa*), a bat (*Rhinolophus gorongosae*), a new species and genus of Katydids (*Tettigoniidae*) (Naskrecki & Guta, 2019) and a new plant species *Cola cheringoma* (Cheek et al., 2019). Therefore, the KBA status at this site enhances the recognition of Gorongosa National Park and the Marromeu complex as being sites that contribute significantly to the persistence of biodiversity not only on a national scale, but also globally.

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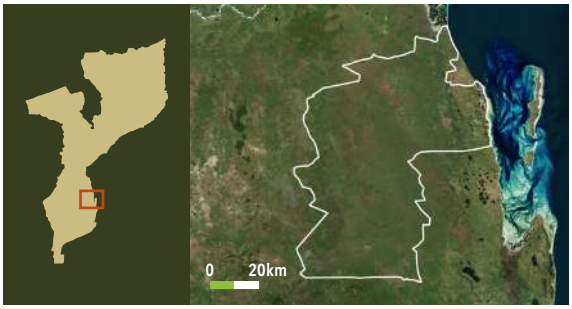
KEY BIODIVERSITY AREAS

INHASSORO-VILANKULOS

SITE ID: 49149



ADMIN REGION: Inhambane

KBA AREA: 5,357.43 km²

COORDINATES: -22.05 S, 35.39 E

CURRENT PROTECTION CATEGORY: N/A

PRE-EXISTING DESIGNATION: N/A

KBA CRITERIA TRIGGERED: A1a, A1b, B1

SITE DESCRIPTION

This KBA, located in the province of Inhambane, southern Mozambique (MAE, 2014), covers an area of about 5,357 km². It includes the coastal and inland region of the Inhassoro district in its northern section, and the inland region of the Vilankulos district in its southern section. The region's climate is dominated by dry tropical zones in the inland, and a humid coastal zone. The hot and rainy season runs from October to March and the cool and dry season from April to September (MICOA, 2012). The coastal region has an annual average temperature between 18 °C and 33 °C and the annual rainfall average in the rainy season (October from March) is 1,500 mm with greater incidence in the months of February and March when floods occur (MAE, 2014). The inland region has an annual rainfall average of 1,000 to 1,500 mm with high temperatures, often causing water deficiency (MAE, 2014). The KBA constitutes three predominant vegetation types: dune vegetation, thickets or miombo woods and deciduous forest mosaic (MICOA, 2012). In coastal dunes, pioneer species such as *Sesuvium portulacastrum*, *Cyperus maritimus*, *Scaevola thunbergii*, and *Ipomoea pes-caprae* create conditions for the establishment of coastal thickets. In the eastern region, in the sublittoral zone, miombo woodlands predominate in sandy soils consisting of *Brachystegia spiciformis* accompanied by secondary species such as *Albizia adianthifolia*, *Garcinia livingstoney*, *Afzelia quanzensis*, *Pterocarpus angolensis*, etc. This region also includes a narrow strip of wetlands, formed by the Govuro River (MICOA, 2012). Inland there are forests of *Brachystegia spiciformis* - *Julbernardia globiflora* in a mosaic with deciduous forests of *Afzelia* - *Sideroxylon* - *Balanites*. The forest consists of small patches that pass to savanna grasslands with scattered trees of *Adansonia digitata*, *Cordyla africana*, *Kirkia acuminata*, *Sterculia africana*, *Acacia nigrescens*, etc. The most extensive areas of grassland are concentrated in the western interior close to the border with the district of Mabote (MICOA, 2012).

TRIGGER SPECIES

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MAIN THREATS

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RATIONALE

This site is home to several plant species, of which **5 threatened and restricted distribution species have met the KBA thresholds at this site**. Namely: *Ecbolium hastatum* EN, *Croton aceroides* EN, *Croton inhambanensis* VU, *Ozoroa gomesiana* VU and *Xylia mendoncae* VU. All these species are under human pressure from habitat loss and degradation due to increasing human settlement, urban development and recreation, tourism, and coconut plantations. Poor soil condition in this area lead to the increased practice of shifting agriculture (Sitoe et al., 2015). With this coupled to an increasing demand for different land use, there is a substantial modification of the structure, composition, and primary ecological functions of this area, which is the main threat for the trigger species of this proposed site (Sitoe et al., 2015). The range of these species is severely fragmented, and their sub-populations are becoming increasingly isolated. Inhassoro District has marked signs of erosion that dominate the coastal strip. This erosion phenomenon is due to overcrowding in residential, commercial and tourist areas in the coastal area which accentuate the degradation of the soil and the circulation of tourist vehicles on the beaches, as well as the use of the margins for agriculture (MICOA, 2012)

Despite existing threats, the biodiversity importance of this site is unquestionable. Strong management measures are needed in order to avoid total habitat loss, and consequently the extinction of these threatened restricted distribution species. Acknowledgement of KBA status for this site will likely draw the attention of local and international conservation entities to implement measures to ensure the persistence of the site's biodiversity.

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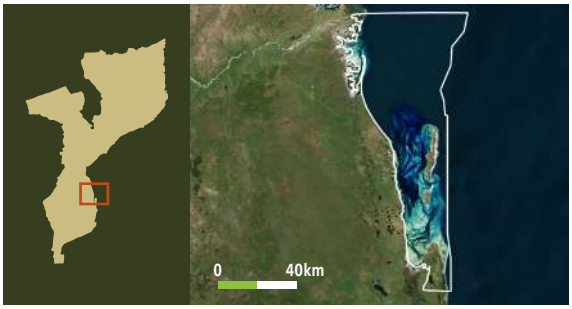
KEY BIODIVERSITY AREAS

GRANDE BAZARUTO

SITE ID: 6688



ADMIN REGION: Inhambane

KBA AREA: 5,236.36 km² **COORDINATES:** -22.05 S, 35.57 E

CURRENT PROTECTION CATEGORY: Partially covered by a National Park and Sanctuary

PRE-EXISTING DESIGNATION: IBA, IMMA

KBA CRITERIA TRIGGERED: A1a, A1b, A1c, A1d, B1

SITE DESCRIPTION

This KBA covers an area of about 5,236 km², encompassing the Bazaruto Archipelago and the São Sebastião peninsula, located in the Inhambane province, between the districts of Vilankulo and Inhassoro, southern Mozambique. The Bazaruto archipelago is comprised of five islands: Bazaruto, the largest (12,000 ha), Benguérua (2,500 ha); Magaruque (600 ha); Santa Carolina (500 ha) and the tiny island of Bangué, with about 5 ha. The Bazaruto archipelago was formed from the São Sebastião Peninsula about 7,000 years ago (Everett et al., 2008) The São Sebastião Peninsula lies southeast of the town of Vilankulo, forming the continental extension of the Bazaruto archipelago (Jacobsen et al., 2010).

The climate in the region is hot and humid, with rainfall ranging from 600 to 800 mm per year (Jacobsen et al., 2010). Average temperatures are around 30 °C in summer and 18 °C in winter, with an average annual temperature of 24 °C (Everett et al., 2008). The Bazaruto archipelago is known for its diverse marine habitats, including mangrove forests, coastal dunes, rocky beaches, seagrass meadows, coral reefs, lagoons, and white sand beaches. The São Sebastião peninsula is dominated by miombo woodland interspersed with a diversity of habitats that include wetlands, freshwater lakes, tidal mudflats, salt marshes and mangrove swamps. The marine area includes estuaries, a sand peninsula barrier along the seaward boundary of the Inhambane Estuary, islands, and coral reefs (Lambrechts, 2001 in Peel, 2002).

TRIGGER SPECIES

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RATIONALE

The Bazaruto Archipelago and São Sebastião Peninsula harbor significant populations of **at least six species (marine and terrestrial) that met several KBA criteria**. Two marine species met the KBA thresholds, namely the Indian Ocean humpback dolphin (*Sousa plumbea* EN), a species with a narrow habitat preference, restricted distribution and low abundances (Braulik et al., 2015) and the dugong (*Dugong dugon*, VU) a coastal zone species of shallow to medium depth waters, with the Bazaruto Archipelago possibly being the only site with a viable population of this species in the Western Indian Ocean (Guissamulo, 2004; Pereira & Videira, 2009). Terrestrial trigger species include three reptiles with restricted distribution and endemic to the Bazaruto region (*Scelotes duttoni* LC, *Mochlus lanceolatus* LC, *Scelotes insularis* LC), an endemic and threatened plant species, *Jatropha subaequiloba* (VU), and a threatened bird species, damara tern (*Sterna balaenarum*, VU) with about 75 individuals recorded on the São Sebastião Peninsula, most likely representing a local non-breeding population of migrants from southern breeding grounds. This population represents 1.4-3.7% of the global population, making this site globally significant for this species.

In addition to the KBA triggers species, this site is also home to many other species of conservation concern, such as the green turtle *Chelonia mydas*, EN, which is threatened by fisheries by-catch, illegal targeting and consumption by local fishermen (Jacobsen et al., 2010). It is also likely to harbor a significant population of *Memecylon insulare* (CR) known only from two herbarium collections dated 1958 and 1963. This KBA is encompassed by an Important Marine Mammal Area (IMMA) recently identified by the IUCN Marine Mammal Protected Areas Task Force.

The present status of KBA at this site enhances the recognition of greater Bazaruto and demonstrates that it is an area not only of national and regional importance, but also of global importance for the persistence of biodiversity.

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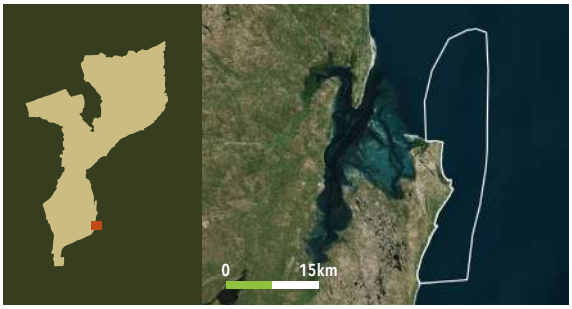
KEY BIODIVERSITY AREAS

TOFO

SITE ID: 49172



ADMIN REGION: Inhambane

KBA AREA: 341.9 km²

COORDINATES: -23.83 S, 35.67 E

CURRENT PROTECTION CATEGORY: N/A

PRE-EXISTING DESIGNATION: N/A

KBA CRITERIA TRIGGERED: D1b

SITE DESCRIPTION

This KBA covers mostly the Tofo region located in Inhambane Province, southern Mozambique. The main ecological feature of the region is a complex system of parabolic coastal dunes with associated vegetation and barrier lakes, extending northwards to the Inhambane Bay, characterized by shallow seagrass meadows and mangroves under strong tidal influence. On the ocean front, exposed to strong wave action and the Mozambique Current, there is a series of reefs that originate from fossilized sand dunes, now colonized by a thin veneer of hermatypic corals (Motta et al. 2002).The reef system extends along about 40 km of coastline, 500 m to 15 km offshore, with depth varying between 22 and 32 m.

With a sub-tropical climate regime, water temperature varies seasonally from a high of 30 °C during summer months (Dec–Mar) to 16 °C during the winter (Jul–Sep) (Rohner et al. 2013). Tofo is a small and relatively undeveloped town dependent on tourism, mainly around diving, surfing and beaches. It is famous amongst tourists as a marine megafauna hotspot, where whale sharks, manta rays, dolphins, humpback whales and sea turtles can be sighted year-round for most. It is one of few places globally where year-round populations of whale shark, *Rhincodon typus* and manta rays, *Manta birostris* and *M. alfredi* occur (Tibiriçá et al., 2011). Since many of the reefs offshore of Tofo serve as cleaning stations for elasmobranchs, most notably both species of manta rays, this stretch of coast is the most popular diving location in Mozambique, receiving the highest number of recreational divers per year countrywide (Saoirse et al, 2019).

TRIGGER SPECIES

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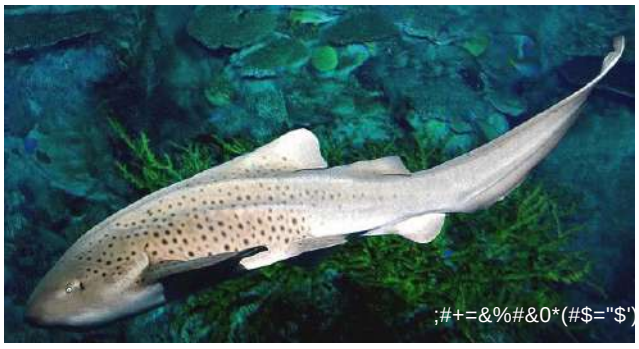

MAIN THREATS

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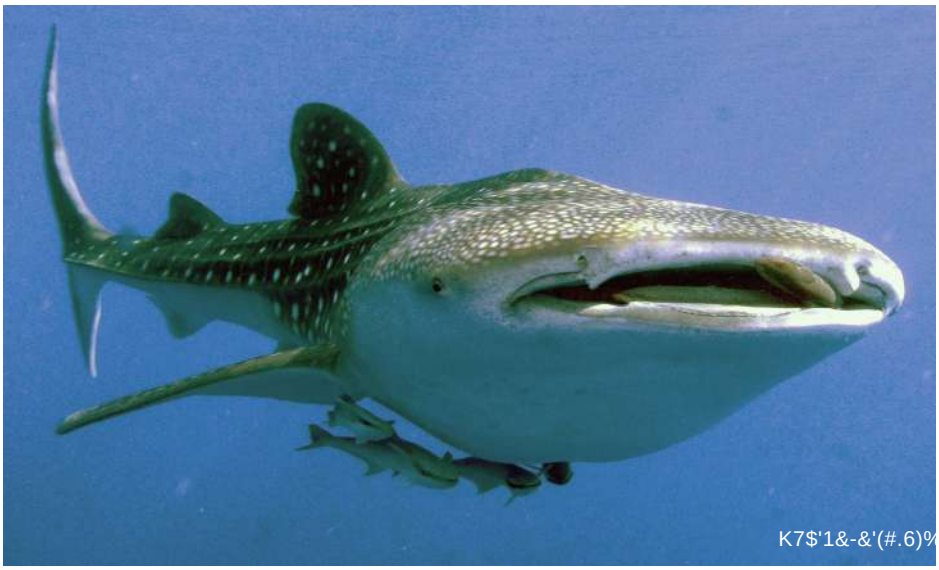
RATIONALE

At least four elasmobranch aggregations triggered the KBA criteria for this site. It is one of the few sites worldwide where both species of manta rays (*M. birostris* EN, and *M. alfredi*, VU) occur in year-round populations. Tofo is home to the world's second largest documented *M. alfredi* population with over 1,000 identified individuals. It also represents one of the most significant aggregation sites for *M. birostris* in the Indian Ocean (MantaMatcher, 2016) and has been identified as a critical reproductive habitat for this species (Marshall & Bennett, 2010; Marshall et al. 2011). These species have recently received formal protection in Mozambique but suffer from pressures in Tofo and throughout their area of occupancy, which has driven population decline of up to 88% over the last decade (Pierce et al., 2010; Rohner et al., 2013). Similarly, the endangered whale shark *Rhincodon typus* is known to form large aggregations year-round at the site (Pierce et al. 2010), but the number of sightings has also suffered a dramatic decrease in the recent past, with up to 79% reduction (Rohner et al., 2013). Furthermore, the zebra shark (*Stegostoma tigrinum*, EN) also aggregates in significant numbers year-round. Beyond theses species, Tofo harbours a rich marine biodiversity from reef corals, reef fish and invertebrates, through to migrant humpback whales (*Megaptera novaeangliae*, LC) and occasional visitors such as the great white shark (*Carcharodon carcharias*, VU) and the orca (*Orcinus orca*, DD). Among a variety of sharks, such as the whitetip reef shark (*Triaenodon obesus*), the bull shark (*Carcharhinus leucas*) and the tiger shark (*Galeocerdo cuvier*), it is worth noting the occurrence of the critically endangered wedgefish (*Rhynchobatus djiddensis*). Because of the four species that meet the KBA criteria, Tofo is therefore considered a Key Biodiversity Area. Tofo is not formally protected yet, so the KBA status could potentially draw attention of conservation agencies at national and international levels to promote the formal protection of the site so that its biodiversity can persist over time.



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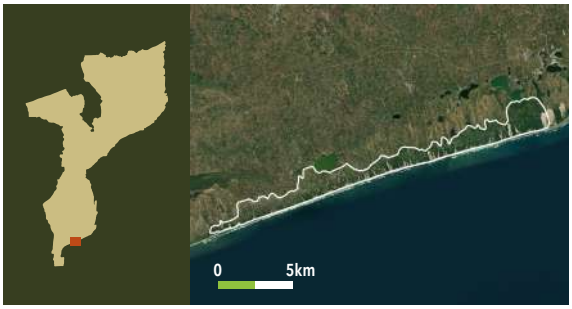
KEY BIODIVERSITY AREAS

CHONGOENE

SITE ID: 49146



ADMIN REGION: Gaza

KBA AREA: 32.59 km²

COORDINATES: -25.10 S, 33.71 E

CURRENT PROTECTION CATEGORY: N/A

PRE-EXISTING DESIGNATION: N/A

KBA CRITERIA TRIGGERED: A1b, B1

SITE DESCRIPTION

This KBA covers an area of about 32 km² and is located on the coast of the Chongoene district in Gaza province, southern Mozambique. The Chongoene district was formerly known as an administrative post of Xai-Xai district, having being changed to district in 2016. The borders include Chibuto district to the north, the Indian Ocean to the South, Manjacaze District to the East and the Xai-Xai city to the West (Governo da Província de Gaza, 2017).

The region is influenced by the anticyclones of the Indian and Atlantic oceans, by the high-pressure continental cell during the cool season and by the continental depression of thermal origin during the hot season (MAE, 2014). The average annual temperature is 22.9 °C with February being the warmest month (26 °C) and July the coldest (19.1 °C) (MICOA, 2012). The average annual rainfall in the region is 768 mm and the annual evapotranspiration 1,190 mm. The soils are mainly sandy of coastal dunes and coastal sandstone with recent alluvium (MICOA, 2012; MAE, 2014). The sandy beaches of this site are characterized by parabolic dunes that extend up to 10 km inland and along the entire coastline. The region is covered by the Tongoland-Pondoland Regional Mosaic, which extends along the Indian Ocean from the mouth of the Limpopo River to the foothills of the Drankensberg in Porth Elizabeth, South Africa. This ecoregion has distinct characteristics, because it represents a meeting between the Zambesiaca and temperate African Floras (MICOA, 2012).

TRIGGER SPECIES

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RATIONALE

The coastal dunes of Chongoene district form an ecological niche where a wide variety of flora and fauna species occur. They provide habitat for many coastal communities and are home for one very rare, range restricted and threatened butterfly, *Iolaus lulua*, which is a near-endemic to Mozambique. *I. lulua*, which falls under Vulnerable category of the IUCN's Red List, occurs in coastal forests and thicket bush. Based on its distribution range, this site is estimated to support about 16% of the global population of this species. The subpopulation in Southern Mozambique is under threat from tourism developments and agriculture and its habitat is severely fragmented. Deforestation is thus occurring and there is continuous decline in the habitat quality. A detailed ecological assessment revealed genetic diversity, including plant species of great pharmacological value (MICOA 2012). Coastal dunes are perhaps the most sensitive and threatened areas of Chongoene. They have been devastated to extract wood and for building material for tourist facilities. In many places, deforestation and fires have disturbed the stability of the dunes. Any change in the dunes morphology by deliberate acts may disturb the balance of the entire area unless appropriate measures are taken. As it hosts a significant population of a threatened species, *Iolaus lulua*, Chongoene is therefore qualified as a Key Biodiversity Area.

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KEY BIODIVERSITY AREAS

MANHIÇA-BILENE

SITE ID: 49152

ADMIN REGION: !Gaza

KBA AREA: !2,070.23 km²

COORDINATES: -25.22 S, 33.22 E

CURRENT PROTECTION CATEGORY: Partially covered by game farms

PRE-EXISTING DESIGNATION: KBA (old criteria)

KBA CRITERIA TRIGGERED: A1a, A1b, A1e, B1

SITE DESCRIPTION

This KBA covers an area of about 2,070 km² and is located on the southern coast of Mozambique across two provinces, Maputo and Gaza, covering the region of Limpopo River basin. The average annual temperature of the region is 22.9°C, with February being the hottest month (26°C) and July the coldest (19°C) (Ekblom et al., 2011). The average annual rainfall is 768 mm, however, there is a significant interannual variation. Monthly rainfall is only higher than evapotranspiration for 4 months of the year, namely from December to March (IMPACTO, 2012a).

The site is characterized by the presence of coastal dunes and coastal sandstones. It is located in the area of the great coastal plains of the country, with the altitude rising slightly from the coast to the interior. The region is covered by the Tongoland-Pondoland Regional Mosaic, which stretches along the Indian Ocean, from the mouth of the Limpopo River to the foot of Drakensberg, in Port Elizabeth, South Africa (IMPACTO, 2012a). The Tongoland-Pondoland Regional Mosaic is a mosaic of low and high thickets along waterways that flow into the Indian Ocean. Levels of endemism in this area are relatively low, although there are records of 6,000 to 7,000 plant species that occur in this ecoregion. The scrub vegetation is different from other scrub in this region because there is a predominance of evergreen sclerophilic plants and succulent trees and shrubs (IMPACTO, 2012b). The site is almost continuously bordered by lakes and lagoons. Coastal areas located behind the dune systems in the region present greater representativeness given the occurrence of wetlands. The area includes several seasonal ponds and springs that are mostly used for irrigation (IMPACTO, 2012b).

TRIGGER SPECIES

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RATIONALE

Gaza Province, mostly covered by the Limpopo Basin, has wetlands already recognized as RAMSAR sites, with emphasis on coastal lagoons considered habitats of endemic species, such as Bilene (Couto et al., 2019). There are **four threatened species of plants and** freshwater fsh that meet KBA criteria at this site. Importantly, the endemic plant *Memecylon incisilobum* (CR) is only known to occur only at this single location and has an extent of occurrence (EOO) and area of occupancy (AOO) of 0.005 km^2 or less (Stone et al., 2017). According to Matimele (2016) the species is threatened by forest clearing for subsistence agriculture, wood-cutting for charcoal production, and runaway fires resulting from slash-and-burn agricultural practices. The other plant species is the near endemic *Raphia australis* (VU), which is restricted to swamps and seasonally inundated dunes. Some locations are experiencing ongoing decline in habitat quality due to subsistence farming and urban housing development (Matimele, 2016).

The other trigger species at this site is a freshwater fish listed as endangered (EN), *Chetia brevis*, which occurs in South Africa and southern Mozambique, with restricted distributions even within the systems in which they occur (Bills and Weyl, 2002). This site may also hold another endangered freshwater fish (EN), *Serranochromis meridianus*, with restricted distribution, however more studies will be necessary to confirm their occurrence in Mozambique.

Due to the high importance of this site in perpetuating global biodiversity, it had already been designated as a Key Biodiversity Area in 2016 through Critical Ecosystem Partnership Fund (CEPF) (Maputoland Hotspot profile process in 2008). Acknowledging the presence of additional KBA trigger elements, enhances the existing KBA status of this site, which in turn may call attention of conservation bodies in the country as well as internationally to the need for protection and conservation actions for this site.

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REFERENCES

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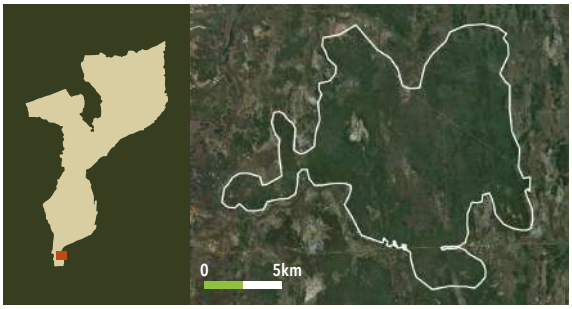
KEY BIODIVERSITY AREAS

MATUTUÍNE

SITE ID: 49153



ADMIN REGION: !Maputo

KBA AREA: !195.09 km²

COORDINATES: -26.26 S, 32.51 E

CURRENT PROTECTION CATEGORY: N/A

PRE-EXISTING DESIGNATION: N/A

KBA CRITERIA TRIGGERED: A1b, B1

SITE DESCRIPTION

This KBA is within the Matutuine district, located in Maputo province, Southern Mozambique, and covers an area of about 195 km². The site lies north of the Licúati Forest Reserve (LFR) and its boundaries include the city of Maputo to the north and mainly the Porto Henrique - Bela Vista road to the south (although it covers a small portion beyond the road southwards), Maputo Bay to the east and the Tembe River to the west. The site is completely flat and falls entirely within the Maputaland Endemism Center.

The climate of the region is generally warm to hot, humid and subtropical given its location within a transitional zone between the tropics to the north and the subtropical coastal conditions to the south. Rainfall has significant spatial variability from the coast to the inland, decreasing as it moves inland (MAE, 2014). Being a continuation of the Licuati Forest vegetation type, it is expected that the site's annual average rainfall will not be over 800 mm. The soils are mostly sandy, characterized by poor water retention capacity and consequently a high infiltration rate (MICOA, 2012; MAE, 2014). Vegetation of the site is mainly comprised of shrubland with patches of Licuati Forest, to the south, and open woodland.

TRIGGER SPECIES

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MAIN THREATS

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RATIONALE

This KBA represents a northward extension of the Licuati Forest habitat type. Therefore, there are patches with the structure similar to those found within the LFR. Given human encroachments, it can be argued that at least 1/3 of the LFR has been reduced since its establishment in 1943 (Matimele, 2016). Moreover, with the recently completed bridge over the Maputo Bay, access to the southern area of the bay has been made easier. Therefore, this area is experiencing a rapid change due to human settlements for housing and small business infrastructure. However, currently it is believed that the key plant conservation in whole of Maputaland region lies in Licuati Thicket together with other similar vegetation types of sand forest (short and tall sand forests) in South Africa, which are home to several endemic and near-endemic plant species (van Wyk and Smith, 2001; Matimele, 2016). This site holds a significant population of two endemic species that are threatened with extinction namely: *Polygala francisci* and Sclerochiton apiculatus both under Vulnerable category of the IUCN Red List. With these two species, this site qualifies as a Key Biodiversity Area (KBA). This site ensures the global persistence of endemic species and the remnants of the Licuati Thicket patches that are somewhat fragmented within the LFR.

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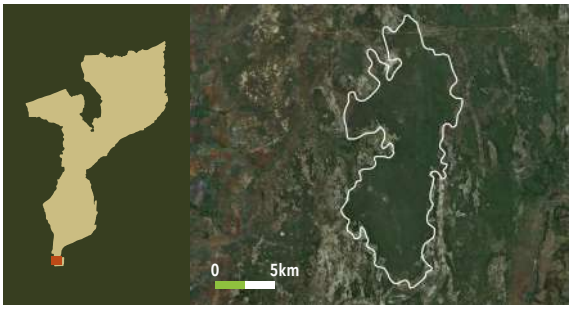
KEY BIODIVERSITY AREAS

LICUÁTI FOREST RESERVE

SITE ID: 49166



ADMIN REGION: Maputo

KBA AREA: 141.02 km²

COORDINATES: -26.47 S, 32.49 E

CURRENT PROTECTION CATEGORY: Forest Reserve

PRE-EXISTING DESIGNATION: N/A

KBA CRITERIA TRIGGERED: A1a, A1b, B1

SITE DESCRIPTION

This KBA encompasses the Licuáti Forest Reserve (LFR) situated in the Matutuíne District in Maputo Province, Southern Mozambique, near the South African and Swaziland borders to the south and west, respectively, and covers an area of about 141 km². It is locally well known as Licuáti Forest and it falls between the Tembe and Maputo Rivers, and the Porto Henrique-Bela Vista, and Bela Vista-Catuane roads (Izidine, 2003). The LFR is found on ancient dunes perhaps of Pleistocene-age. The core LFR is of thicket forest vegetation type, mainly of five meters height with some emergent trees such as *Afzelia quanzensis*, *Newtonia hildebrandtii* and *Balanites maughamii*, reaching 12 m tall. In South Africa the Licuati Forest vegetation type is called short sand forest (Izidine, 2003). The surrounding areas of LFR are mainly of woodland, open grasslands and dry coastal forest. The climate of the region is generally warm to hot, humid and subtropical given its location within a transitional zone between the tropics to the north and the subtropical coastal conditions to the south. Precipitation is low with an annual average rainfall ranging from 500 to 600 mm. Due to this fact, the Licuati vegetation is maintained by moisture blown from the sea.

TRIGGER SPECIES

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RATIONALE

The LFR, established in 1943, was aimed at protecting woody species particularly *Afzelia quanzensis*. Currently, it is believed that the key plant conservation in whole of Maputaland region lies in Licuati Thicket, together with other similar vegetation types of sand forest (short and tall sand forests) in South Africa which are home to several endemic and near-endemic plant species (van Wyk and Smith, 2001; Matimele, 2016). The Licuati Thicket contains many rare plant and animal species. It is very distinctive, not only because of its unique combination of plant and animal species, but also because it is more-or-less confined to the ancient coastal dunes of Northern KwaZulu-Natal and the extreme southern parts of Mozambique. Because of its restricted occurrence and unusual species compliment, Licuati Thicket is one of the most important plant communities in the Maputaland Centre of Endemism (Izidine, 2003). **Six plant species triggered KBA Criteria** in LFR, of which three are Endangered (*Empogona maputensis*, *Warneckea parvifolia* and *Xylopia torrei*), two Vulnerable (*Polygala francisci* and *Sclerochiton apiculatus*), and one Near Threatened (*Psydrax fragrantissima*). In general, distribution of *Empogona maputensis* and *Warneckea parvifolia* is restricted to the Licuati Forest vegetation type. The two species are also found in KwaZulu-Natal, South Africa, in areas with vegetation similar to the Licuati Forest. In South Africa, those other sand forest patches are found in areas such as Tembe Elephant Park. The LFR also holds the *Acridocarpus natalitius var linearifolius*, a Vulnerable species at variety level hence, not included as KBA trigger.

Apart from plants, the Licuáti Thicket is also home to many small mammals, birds and insects, some of which are endemic to the Maputaland region (Izidine, 2003). The LFR is the source of some key livelihoods including medicinal plants, building material, firewood for the local communities and charcoal to fulfill the needs of source of energy in the nearby capital city, Maputo, and surrounding areas, including Boane and Matola. The unique vegetation and the endemic flora and fauna of LFR, and specially the Licuáti Thicket which holds some sacred areas, are valuable natural assets and could make the area an important ecotourism destination in Southern Africa. Because it hosts significant populations of endemic and threatened plant species, the Licuati Forest Reserve qualifies as a Key Biodiversity Area.

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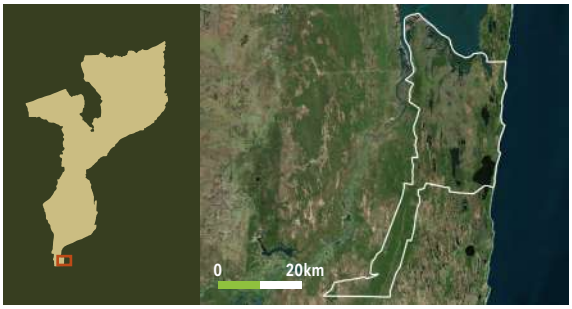
KEY BIODIVERSITY AREAS

MAPUTO SPECIAL RESERVE

SITE ID: 6685



ADMIN REGION: Maputo

KBA AREA: 1,039.7 km² **COORDINATES:** -26.37 S, 32.75 E

CURRENT PROTECTION CATEGORY: Special Reserve, Environmental Protection Area

PRE-EXISTING DESIGNATION: IBA, Ramsar

KBA CRITERIA TRIGGERED: A1a, A1b, A1c, B1

SITE DESCRIPTION

Covering an area of about 1,039 km² the proposed KBA encompasses the whole Maputo Special Reserve (MSR) including the Futi Corridor. The MSR lies in the Matutuíne District of Maputo Province in Southern Mozambique, south of Machangulo Peninsula. Its current boundaries are the Maputo Bay in the north, the Indian Ocean to the east, the Maputo River, the Futi River and a line 2 km east of the Salamanga-Ponta do Ouro road in the west, and the southern end of Lake Xingute and the southern restriction of Lake Piti in the south. This protected area lies within the Maputaland Centre of Endemism, an area running through north-east KwaZulu-Natal to eastern Eswatini and southernmost Mozambique, which is believed to hold about 2,500 endemic plant species or infraspecific taxa (Van Wyk, 1996). The site's altitude ranges from sea level to 194m above sea level, with the higher areas characterized by dunes on the eastern, seaward side of the Reserve and the lower areas on the floodplain of the Maputo River on the western side. The climate is characterized by a warm and rainy season (from October to March, with temperatures ranging from 26 ºC to 30 ºC) and a cold and dry season (from April to September, with temperatures ranging from 14 ºC to 26 ºC). Annual average rainfall is between 690-1,000 mm (de Boer and Ntumi, 2001). The soils are sandy, with low nutrient content except along the Futi and Maputo river floodplains, where the soils are alluvial, with clay and organic matter and are generally fertile (De Boer and Ntumi, 2001). The soils are mainly Aeolian sand deposits of marine origin, which rest on an undulating impermeable Cretaceous siltstone floor. The undulating sand ridges are interspersed with depressions that can have a higher clay content (Parker and de Boer, 2000). According to DNAC (2010), the vegetation of the MSR is characterized by a unique mosaic of varied ecosystems including: mangroves, dune vegetation, wooded grasslands, sand forest-woodland mosaic, sand forest, savannah and riverine vegetation.

TRIGGER SPECIES

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RATIONALE

The Maputo Special Reserve is within the Tongonland-Pondoland regional mosaic which has been recognised as a global biodiversity hotspot. The van Wyk's Maputaland Centre of Endemism is in fact a subdivision of the broader Tongoland-Pondoland region. This site is, therefore, at a transition area between the tropical and temperate zone but it shows solid links to the tropical vegetation of the eastern Africa sensu Clarke (1998) stretching from Inhambane to Somalia. Some Lagoons within the MSR including Satine, Piti, Chingute, Mandejene/Pandejene and Tzembezanhe have been regarded as RAMSAR sites (Couto, et al., 2019). Moreover, the MSR together with the Ponta do Ouro Marine Partial Reserve was identified as potential World Heritage Site which strengthens the national and international recognition of the importance of these areas (Couto et al., 2019). This site holds significant populations of at least five species among plants, insect, freshwater fish and mammals that **have met the KBA thresholds**, namely: the African Savanna Elephant (*Loxodonta africana*) assessed as Endangered and facing population decline, one vulnerable plant species, *Sclerochiton apiculatus* (VU); two restricted-range insect species, *Amblyphymus adspersus* (NT) and *Scarabaeus bornemizzai* (NT), and one endangered freshwater fish species, *Silhouettea sibayi* (EN) which is a very range restricted species with an area of occupancy (AOO) about 16 km^2, and is experiencing decline in habitat quality across its known range. This site is also particularly rich in avifauna, in fact the MSR has already been recognized as an Important Bird Area (IBA-MZ001) by Parker (2001). The site also hosts threatened mammal species that are facing population decline, such as hippopotamus (*Hippopotamus amphibius* - VU) and giraffe (*Giraffa camelopardalis* VU). In summary, this site is protecting globally important populations of multiple species as well as a variety of locally important biodiversity elements, for that reason the Maputo Special Reserve is recognized as a Key Biodiversity Area.

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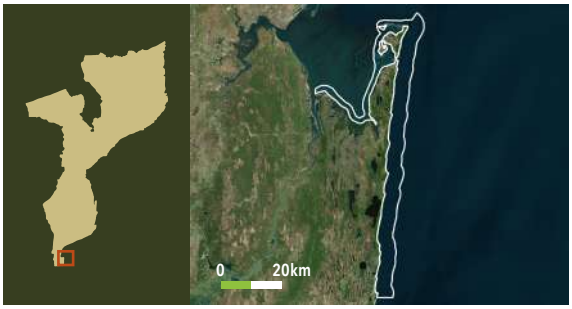
KEY BIODIVERSITY AREAS

PONTA DO OURO

SITE ID: 49168



ADMIN REGION: Maputo

KBA AREA: 698.2 km² **COORDINATES:** -32.95 S, 26.35 E

CURRENT PROTECTION CATEGORY: Partial Marine Reserve, Environmental Protection Area

PRE-EXISTING DESIGNATION: N/A

KBA CRITERIA TRIGGERED: A1b, A1c, D1b

SITE DESCRIPTION

The proposed KBA covers an area about 698 km² and follows the boundaries of the Ponta do Ouro Partial Marine Reserve (POPMR) located in southern Mozambique. Established in 2009, the POPMR is under review at time of writing (in 2021) by UNESCO to become a World Heritage Site. The reserve stretches for 86 km along the coast from the border with South Africa to its northernmost point past Inhaca Island and into Maputo Bay at the Maputo River mouth. It extends three nautical miles offshore and to the base of the dunes inland and is regulated by a three-zone management plan (Lucrezi et al., 2016). The POPMR is located within a biogeographical transition area referred to as the Delagoa Bioregion (Daly et al., 2018). The average annual sea surface temperature in the area is about 24 °C, ranging from 22.5 °C in the winter to 26.4 °C in the summer (DNAC, 2011). Primary reef formations in this site are characterized by submerged late Pleistocene beach rock that is colonized by a thin veneer of Indo-Pacific corals (Ramsay & Mason, 1990; Ramsay, 1994) and are associated with a diverse Indo-Pacific fish community (Daly et al., 2015). Recreational fishing within the POPMR is restricted to multiple-use zones and is subject to partial restrictions (only pelagic fish may be targeted, including giant trevally, *Caranx ignobilis*) and bag limits of 10 fish per person per day. No industrial or semi-industrial fishing is allowed, and commercial fishing is restricted to multiple-use zones for registered small-scale fisheries from local communities (Daly et al., 2018). The POPMR is a popular tourist destination due to the scuba diving industry, mainly for shark diving (Lucrezi et al., 2016), whale watching and dolphin sighting. Reefs in the POPMR are a valuable ecological asset as they play a pivotal role in the tourism industry (Daly et al., 2015) and constitute a prominent and unique ecological feature, comprising some of the highest-latitude reefs in the world (Celliers and Schleyer, 2008), and the southernmost coral reef complex of East Africa. The occurrence of large, resident fishes such as potato bass (*Epinephelus tukula*), several species of sharks and marine turtles has resulted in specific dive sites such as 'Bass City' and 'Pinnacles', near Ponta Malongane, becoming popular with divers (Robertson et al., 1996).

TRIGGER SPECIES

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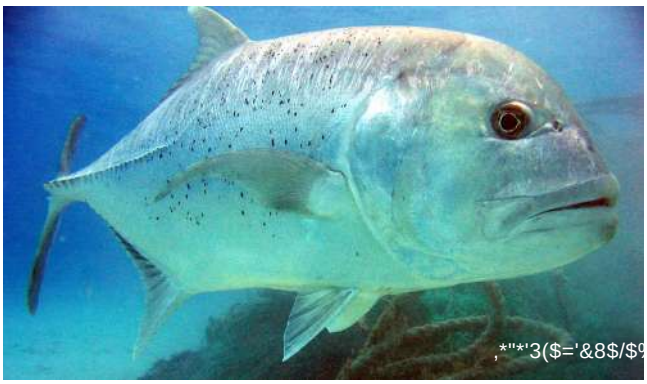
RATIONALE

Three species have triggered the KBA criteria at this site. The first one is the Giant trevally *Caranx ignobilis*, assessed as LC by the IUCN, which is known to form dense aggregations at this site during the spawning season (Daly et al., 2018), resulting in the largest reproductive aggregation recorded worldwide of this species, with up to 2,413 individuals at one point in time. The two other trigger species are Humpback Dolphin *Sousa plumbea* (EN) and the Mud Blenny *Parablennius Iodosus* (VU), endemic to Maputo Bay. Based on quantitative analyses of these species' range distributions, this site is estimated to support about 0.13% of the global population of *Sousa plumbea* and 2.6% of *Parablennius Iodosus*. The reserve hosts a diversity of critical ecosystems, such as parabolic sand dunes and barrier lakes (Pereira et al., 2014), mangrove stands, seagrasses beds (Bandeira & Paula, 2014) and some of the southernmost coral reefs in southeastern Africa (Schleyer & Pereira, 2014), which are the habitats of many vulnerable marine species, including a wide diversity of corals, a remnant population of the vulnerable dugongs, the Indian Ocean bottlenose dolphin, the seasonal migrant humpback whales, at least ten species of sharks, such as bull sharks, tiger sharks and hammerhead sharks, seahorses (Pereira, 2008), migratory birds and two species of marine turtles, *Caretta caretta* and *Dermochelys coriacea*, which nest and forage within the area (Pereira et al., 2009).

In summary, this site protects globally important populations of multiple marine species, as well as a variety of locally important biodiversity elements, which justifies its qualification as a Key Biodiversity Area.



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Key Biodiversity Areas (KBAs) and Red Lists of Species and Ecosystems

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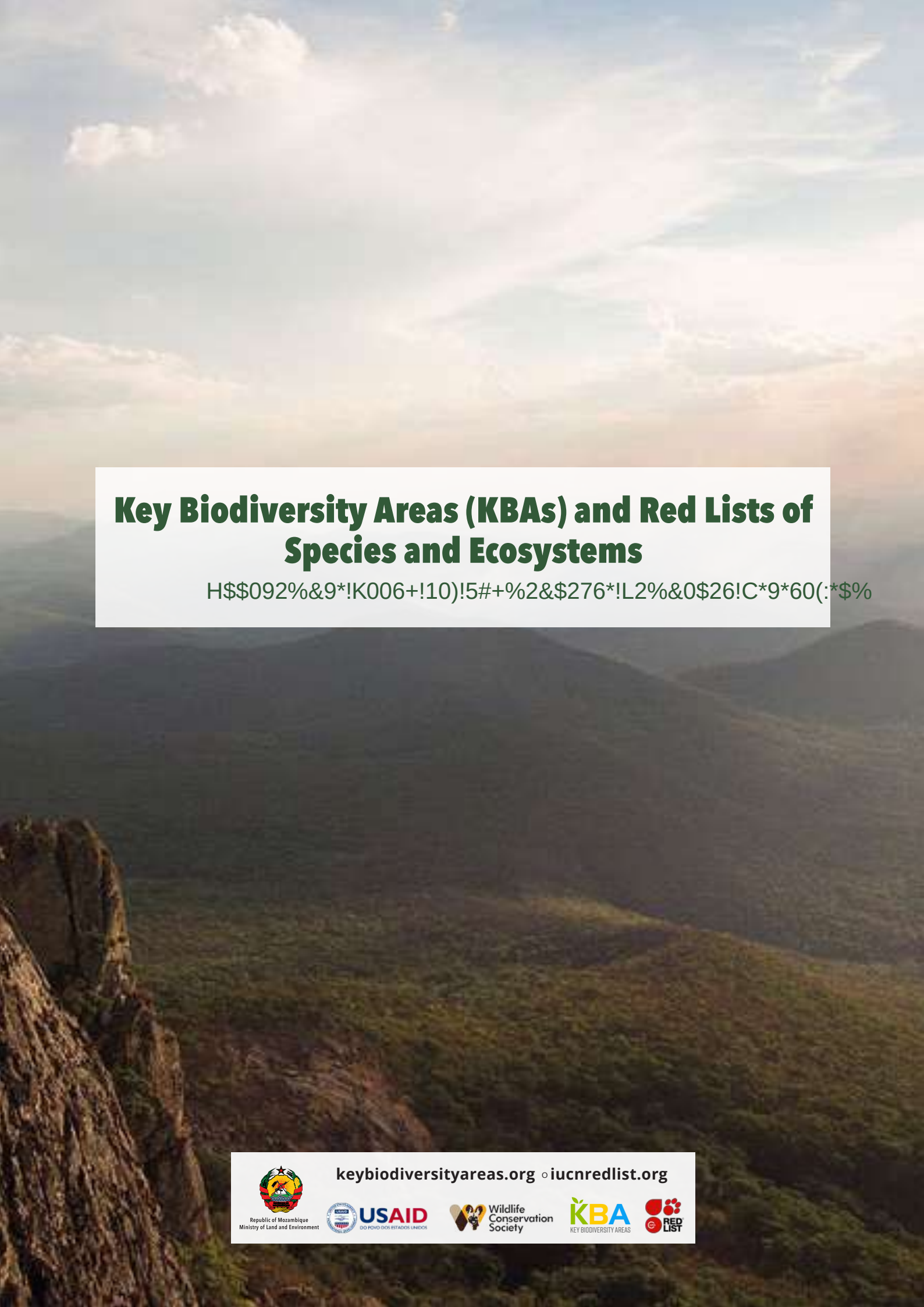

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RED LIST