Available from https://tipas.kew.org/site/mpanga-gorge/
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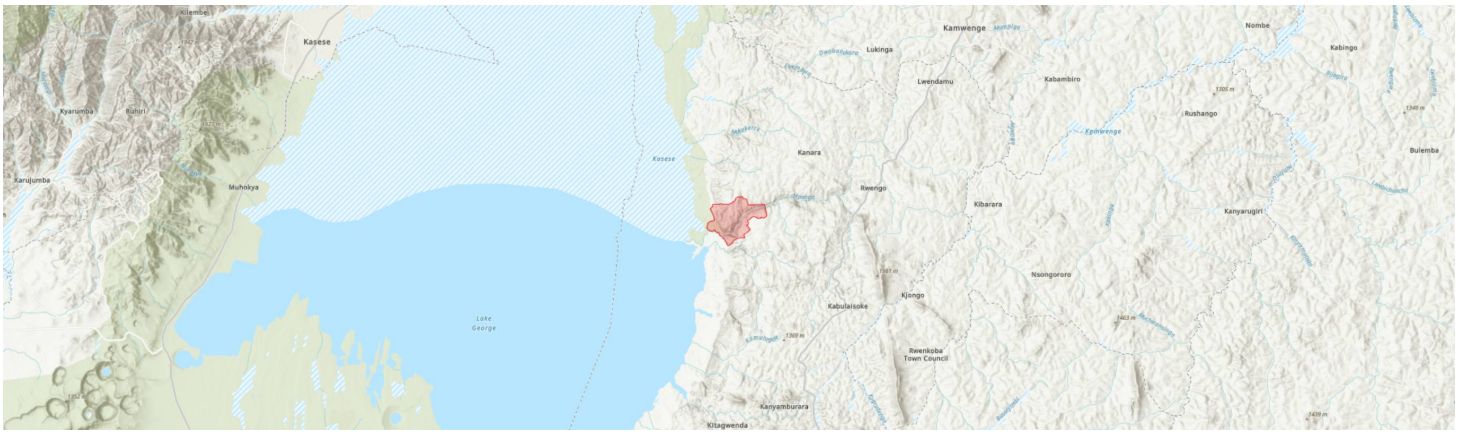
Mpanga Gorge

UGATIPA2



Country: **Uganda**
Administrative region: **Western (Region)**
Central co-ordinates: **0.06650 N, 30.32150 E**
Area: **6.16km²**

Qualifying IPA criteria

A(i)

IPA assessment rationale

Mpanga Gorge qualifies as an IPA under criterion A(i), hosting the entire global population of the Critically Endangered cycad, Encephalartos whitelockii.

Site description

Mpanga Gorge IPA is situated in Kamwenge District of western Uganda and covers an area of 6.16 km2. The IPA encompasses the gorge around Mpanga Falls and the hills surrounding the gorge. The Mpanga River flows through the gorge towards Lake George, situated 3 km southwest of the IPA. The gorge itself has steep slopes, with an incline around 35° in places, while altitudes range from 920 m in the valley floor toward Lake George up to 1996 m in the surrounding hills.

A very narrow strip, less than 3% of this IPA, falls within Queen Elizabeth National Park (QENP), otherwise, the majority of the IPA falls outside this protected area. This IPA boundary delineates the population of cycad species Encephalartos whitelockii and therefore overlaps slightly with the QENP IPA.

Mpanga Gorge has been subjected to serious degradation through the construction of a small hydroelectric dam on the waterfall and the associated network of access roads. However, as the host of the only wild population of E. whitelockii known globally, Mpanga Gorge is of great botanical significance. The site is also thought to support one of the highest concentrations of arborescent cycads globally, with much of the population focused within a 70 ha area (Roberts 2008).

Botanical significance

Mpanga Gorge is of great botanical importance as it contains the entire population, estimated to consist of around 8,000 individuals of the Critically Endangered cycad Encephalartos whitelockii or Muhure cycad (Kalema 2010). This rare arborescent cycad is under threat due to the previous construction of a hydroelectric dam within the gorge, alongside agriculture, particularly the use of fire to refresh pasture.

E. whitelockii occurs on the gorge slopes and on the hills north of the gorge and east of Lake George Ramsar Site. In the gorge towards the Mpanga River, there are almost pure stands of this cycad species. Surveys suggest that juveniles (seedlings and saplings) are significantly more abundant than “poles”, referring to individuals that have progressed beyond the seedling stage but have not yet reached reproductive maturity (Ogwal 2017). While loss of individuals is expected between life stages, the magnitude of this decline between the sapling and pole age classes is such that the population has likely been subject to considerable disturbance impacting maturation of trees (Ogwal 2017). Cycads are long-lived species that may take many years to reach maturity. For E. whitelockii, maturation can even take 10 years. Therefore, the loss of individuals before reproduction will have significant impacts on seed production in the future.

Habitat and geology

Mpanga Gorge IPA is situated in an area with rock system which has been described as partly granitized Precambrian rock formations of the Buganda-Toro System. In this system, argillites (phyllites and schists) predominate, with basal quartzites and amphibolites, estimated at an age of c. 1800 million years (Government of Uganda 1967). This geology gave rise to undifferentiated and young, very stony lithosols that grade into hydromorphic soils farther downstream in the wetland system. The substrate underlying this IPA is a mixture of black granitic soil and areas of sandy loam within the forest (Harrop et al. 1960).

The slopes of Mpanga Gorge are largely covered by medium altitude moist semi-deciduous forest dominated by Cynometra alexandri (ironwood), Celtis spp., Vepris trichocarpa is also common in the lower storey of this forest, while shrubs, including Whitfieldia elongata, are common in the understorey (Darbyshire #1066, #1072). The vegetation is much denser in the zone closer to the river and is Cynometra-Baphia dominated forest. This quickly paves way to dense stands of Encephalartos whitelockii, which is nearly pure in some parts (Kalema 2012). Species associated with E. whitelockii include Cynometra alexandri, Baphia wollastonii, Combretum molle, Acacia hockii, Bridelia scleroneura, Maytenus senegalensis and Rhus natalensis. The cycad dominates many of the very steep slopes on rocky ground that lines the deep gorge.
On the upper slopes of the valley, the forest transitions to Combretum-Encephalartos-Bridelia-Cymbopogon wooded grassland on the stony steep hill slopes and Acacia-Cymbopogon-Themeda/Acacia-Albizia-Pennisetum-Cymbopogon wooded grassland (Kalema 2012). The riverine Cynometra-Baphia forest is estimated to occupy 10% of the IPA, the wooded grassland 85%, and the open grassland, mainly on hill tops farther away from the river valley, 5% (Kalema 2012).

Conservation issues

Only a very small part of the Mpanga Gorge IPA is within QENP, with more than 90% of the global population of E. whitelockii falling outside the National Park (Ogwal 2017). There have been previous discussions surrounding the expansion of QENP into the Mpanga Gorge harbouring the cycads (Nampindo & Plumptre 2005); however, this has not come to fruition to date. Due to the presence of this Critically Endangered cycad, the site has been proposed as a Key Biodiversity Area (KBA), with the additional recommendation that this site should be a priority for conservation financing (Plumptre et al. 2019).

The site suffered extensive disturbance during the construction of a small hydroelectric dam on Mpanga falls in 2011. This dam diverts water away from the river through a channel used to generate hydroelectric power. While the Ugandan Wildlife Authority did initially raise objections to this development, mostly due to the large and unique population of E. whitelockii at this site, construction has gone ahead as planned. The National Environment Management Authority granted permission for it to proceed (Roberts 2008).

Disturbance of the site during dam construction operations may be related to the increase of eventually caused proliferation of invasive plant species within the site. The notable ones recorded in the IPA are Lantana camara, Ricinus communis and Mimosa pigra (Kalema 2012). Lantana camara is the most widespread in the IPA. The coverage by Mimosa pigra is less extensive, mainly along the river valley, while R. communis colonised areas that were opened up by communities for cultivation and along access roads to facilitate dam construction. Pistia stratiotes is observable at the weir, forming green mats over the waters, and along the headrace water canal and forebay area (Kalema 2012).

The impact of the changing hydrology of the area on the E. whitelockiii is not fully understood as yet. However, the change in waterflow and mist precipitation may be detrimentally impacting this cycad (Kalema 2010). The construction of the dam itself resulted in the mortality of many E. whitelockii individuals when access roads were built along contour lines where cycads are most concentrated (Roberts 2008; Kalema & Beentje 2012).

The other major risk to habitats is agricultural activity. Cycads have been seen at the borders of crop gardens at the forest edge, and, as such, it has been inferred that farming may have restricted the distribution of E. whitelockii to more inaccessible areas (Ogwal 2017). While the steep gorge sides are largely unsuitable for farming, the use of fire to refresh pasture for grazing cattle and goats on the hills above and within the gorge itself may be detrimental, although cycads are often able to resprout following burns. In addition, farmers would previously bring their cattle down the steep gorge sides to access water, causing habitat disturbance at the site (Bradley 2019).

However, a partnership between the NGOs JESE and PROTOS alongside the IUCN Save Our Species Programme has helped to support the conservation of E. whitelockii among local communities. New hydraulic pumps were installed to bring water up and outside the gorge, with pumps for both people and livestock. This benefits local communities by providing easier and safer access to clean drinking water and making water more accessible for cattle, which in turn reduces the disturbance on E. whitelockii caused by accessing the river gorge (Moorthamers 2016). In addition, the pumps have been used to support crop irrigation which has reduced reliance of local people on maize and has allowed the growth of a wider range of fruit and vegetable crops, thereby improving nutritional variety and increasing income through agricultural sales (Lawrence & Christopher 2020).

As part of the same conservation programme, the area in which E. whitelockii grows has been demarcated by white poles, and awareness has been raised among local people. PROTOS also undertook a 15-month project focusing on the propagation of E. whitelockii seedlings, which included the construction of 8 large propagators that can house up to 6,400 seeds, alongside training of youth group leaders in caring for seeds in the propagators (Bradley

2019). While it was previously thought that this cycad was dependent on baboons for germination, seeds were successfully germinated in propagators in community nurseries. Seedlings have subsequently been planted out in the gorge in areas where fire has previously destroyed cycads and also along the access roads where cycads were previously cleared (JESE 2017). A subsequent Darwin Initiative project focused on Ugandan cycads raised 6,700 E. whitelockii seedlings between 2014 and 2017, with over 6,000 of these planted at two sites within the gorge (Pritchard & Seal 2017). Further research is required to understand how well these seedlings have persisted in the area. As part of this Darwin Initiative project, stakeholder engagement work was also undertaken, including the production of educational materials and the inclusion of two additional local communities in nursery work (Pritchard & Seal 2017). Further, through a Rufford-funded project led by Dr Collins Bulafu, 120 germplasm were seed banked with the Uganda genebank at Entebbe (Bulafu, pers. comms. 2024).

There have been reports of some collecting of the cycad for ornamental purposes, which would have a detrimental impact on an already threatened population (Kalema 2010). However, with the success of the local propagation programmes, local people are now able to sell E. whitelockii seedlings sustainably, providing an income source while also increasing cycad numbers (Save Our Cycad Project 2017).

Site assessor(s)

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Date of first assessment:
27th Aug 2024

Reviewed by:
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IPA criterion A species

SPECIES	QUALIFYING SUB-CRITERION	≥ 1% OF GLOBAL POPULATION	≥ 5% OF NATIONAL POPULATION	1 OF 5 BEST SITES NATIONALLY	ENTIRE GLOBAL POPULATION	SOCIO-ECONOMICALLY IMPORTANT	ABUNDANCE AT SITE
Encephalartos whitelockii P.J.H.Hurter	A(i)	✓	✓	✓	✓	✓	Abundant

IPA criterion C qualifying habitats

HABITAT	QUALIFYING SUB-CRITERION	≥ 5% OF NATIONAL RESOURCE	≥ 10% OF NATIONAL RESOURCE	1 OF 5 BEST SITES NATIONALLY	AREAL COVERAGE AT SITE
Medium Altitude Semi-Deciduous Forest (EN)	C(iii)	–	–	–	5
Dry Combretum wooded grassland (VU)	C(iii)	–	–	–	1

General site habitats

GENERAL SITE HABITAT	PERCENT COVERAGE	IMPORTANCE
Forest - Subtropical/Tropical Moist Lowland Forest	–	Major
Wetlands (inland) - Permanent Rivers, Streams, Creeks [includes waterfalls]	–	Minor
Savanna - Moist Savanna	–	Minor
Rocky Areas - Rocky Areas [e.g. inland cliffs, mountain peaks]	–	Minor
Artificial - Terrestrial - Pastureland	–	Minor
Artificial - Aquatic - Canals and Drainage Channels, Ditches	–	Minor

Land use types

LAND USE TYPE	PERCENT COVERAGE	IMPORTANCE
Industrial development	–	Major
Agriculture (pastoral)	–	Minor
Tourism / Recreation	–	Minor

Threats

THREAT	SEVERITY	TIMING
Residential & commercial development - Tourism & recreation areas	Medium	Future - planned activity
Agriculture & aquaculture - Livestock farming & ranching - Small-holder grazing, ranching or farming	Low	Ongoing - declining

THREAT	SEVERITY	TIMING
Energy production & mining - Renewable energy	High	Ongoing - stable
Natural system modifications - Fire & fire suppression - Increase in fire frequency/intensity	Medium	Ongoing - declining

Protected areas

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

Conservation designation

DESIGNATION NAME	PROTECTED AREA	RELATIONSHIP WITH IPA	AREAL OVERLAP
Mpanga Falls	Key Biodiversity Area	protected/conservation area overlaps with IPA	3
Mpanga Falls	Alliance for Zero Extinction Site	protected/conservation area overlaps with IPA	3

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