Mgahinga Gorilla National Park

Mufumbiro Mountains (Test version)

UGATIPA12

Country: **Uganda**
Administrative region: **Western (Region)**
Central co-ordinates: **-1.36834 N, 29.63931 E**
Area: **38.5km²**

Qualifying IPA criteria

A(i), B(ii), C(iii)

IPA assessment rationale

Mgahinga Gorilla National Park qualifies as an IPA under sub-criteria A(i), B(ii) and C(iii). There are 15 plant taxa globally threatened with extinction within this IPA, 12 Vulnerable and three Endangered, while six taxa have restricted ranges under the B(ii) threshold of 10,000 km2, many of which are endemic to the Virunga Mountains, representing over 3% of the national list of endemic and range restricted species. Finally, this site triggers criterion C(iii) as one of the five best sites in Uganda for Afromontane rainforest, a nationally Endangered habitat.

Site description

Mgahinga Gorilla National Park (MGNP) encompasses parts of three of the Virunga volcanoes, each of which are either extinct or dormant. Mount Muhavura, the easternmost volcano in the Virungas, is the largest (4,127 m) followed by Mount Sabyinyo (3,645 m) and Mount Gahinga (3,474 m) which lies between the latter two volcanoes (Butynski & Kalina 1993).
MGNP covers an area of 38.5 km2 in Kisoro District in the most southwesterly corner of Uganda. As these mountains form political boundaries between Uganda, D.R. Congo and Rwanda, the protected area is contiguous with Parc National des Volcans in Rwanda and Virunga National Park in D.R. Congo, representing a joint conservation area that encompasses the entirety of the Virunga Mountain Range (UNEP-WCMC & IUCN 2023).

Botanical significance

MGNP is one of the richest sites in Uganda for plant diversity and, although not as extensive as on other mountains such as Elgon and the Ruwenzori, is one of the best examples of nationally Endangered habitat Afromontane rainforest in Uganda (Richards et al., In Review).
Several threatened and range restricted species are known from this site. Kniphofia bequaertii, an Endangered perennial herb, is known only from two sites nationally, Echuya CFR and MGNP. Globally the only other known localities are within neighbouring Virunga National Park in D.R. Congo and the Mahali Mountains in Tanzania (Beentje et al. 2019). Another Endangered taxon, Crotalaria mesopontica subsp. glabrescens is only known from the Virunga Mountains and the highlands around Ijenda, Burundi, and as a result qualifies as range restricted under IPA criterion B(ii). Conservation of these two Endangered taxa within MGNP is of major importance to their protection globally. Last collected at this site in 1939 in high altitude grasslands of Mount Muhavura, K. bequaertii is also known from Mount Mgahinga in grassy areas of a bamboo grove (Snowden #1593). Citizen science records suggest that this species is still extant at the site (Clark 2008) although further surveys of this species would be beneficial to better understand the population at this site.
A third Endangered species, Emilia pammicrocephala, is a herb known from all three mountains of MGNP with collections also made in the Mgahinga-Muhavura saddle. The known habitats for this species include grassland slopes (Calder #5), bamboo glades (Eggeling #962), rocky slopes in upland forest (Lye #5294) and mountain woodland (Purseglove #2188). MGNP encompasses the entire national population of E. pammicrocephala. Elsewhere this species has most frequently been collected on the Marungu Plateau in D.R. Congo, however, much of the habitat in this area has now been cleared and so conservation at MGNP is of great importance. At least eight collections made from this IPA and, given the threats elsewhere, this site likely hosts the one of most significant populations of this species globally.
Alongside E. pammicrocephala, several other Asteraceae of conservation importance are known from this site. Bothriocline ruwenzoriensis, Helichrysum mildbraedii and Vernonia calvoana subsp. adolfi-friderici are three globally Vulnerable Aseteraceae known from this site. Bothriocline ruwenzoriensis is the most widespread of the three, with a range extending to south D.R. Congo, while the other two taxa are Albertine Rift Endemics. H. mildbraedii was collected from short grass in an area of moorland on Mount Mgahinga (Burt #2801) but is known elsewhere in the Virunga mountains in the Hypericum zone, so may well be more widespread in MGNP. All three species face significant threats at other sites, while MGNP represents a secure site to conserve these species (Ntore et al. 2019, Amani et al. 2022a, b). B. ruwenzoriensis and H. mildbraedii were both noted in surveys by Owiunji et al. (2005) of the Virunga Volcanoes made in the early 2000s, from the Sabyinyo-Gahinga-Muhavura sectors. While this checklist does not state whether these observed plants were from the Rwanda or Uganda side of the border, this evidence is supportive of the continued existence of these populations within the IPA. Similarly, Vernonia

calvoana was collected in all sectors of the Virunga Volcanoes during this survey work. As Vernonia calvoana subsp. adolfi-friderici is the only subspecies known from the Virungas (Beentje 2000), it is highly probable that this Vulnerable taxon was collected more recently within this IPA.
In addition to these three threatened taxa, there are three near-endemic Asteraceae known from MGNP that qualify under IPA criterion B(ii). Both Conyza montigena var. fosseyae (LC) and Senecio polyadenus (LC) are endemic to the Virunga mountains. C. montigena var. fosseyae is known from Mount Mgahinga (Harrington #88), while S. polyadenus is known from at least three specimens located on Mount Muhavura with an additional specimen from the Mahavura – Mgahinga saddle (Stauffer #615). A second variety of Conyza montigena known from this IPA, var. montigena (LC), is only known from the Virunga and Ruwenzori Mountains globally.
In total, there are six range restricted taxa under IPA criterion B(ii) known from this site. The remaining two, the epiphytic orchid Polystachya proterantha (LC) and shrubby Lamiaceae species Coleus goetzenii (LC), are only known nationally from MGNP. Elsewhere, both of these species are known from Nyungwe National Park in Rwanda, while C. goetzenii is also known from the Rwanda and D.R. Congo sectors of the Virunga Mountains.
Two other Lamiaceae species known from this site are also of conservation significance, both of which have been found to be Vulnerable to extinction. Leucas alluaudii is an Albertine Rift Endemic, which is threatened by habitat loss elsewhere in its range, and Ajuga leucantha , which has a highly disjunct distribution, from in and around the Virunga Mountains and the Ethiopian highlands. Much of this latter species' former habitat, at low elevations outside each of the three protected areas on each side of the national boundaries within these mountains, has been lost to agriculture (Amani et al. 2022c). The remaining population in MGNP is of great significance in conserving the southern extent of this highly disjunct species.
Overall, there are 13 threatened species known from this site, many of which are endemic or near-endemic to the Albertine Rift. There is extensive intact habitat at this site and so it serves as an important opportunity to conserve these plant species. A checklist of plants for MGNP is not available, although at least 1,265 plant species have been recorded from the Virunga Mountains as a whole, while the Sabyinyo-Gahinga-Muhavura chain was found to be the richest in endemic species in the massif (Owiunji et al. 2005). However, further research, particularly at high altitudes, is needed and would likely yield further rare and threatened species records.

Habitat and geology

MGNP is underlain by black humous soils of volcanic origin and is part of the geological Sabinyo Complex (Harrop et al. 1960). The habitats of this site, across the altitudinal gradient, include areas of woodland at the lowest altitudes, montane forests, sub-alpine Hagenia-Hypericum and ericaceous heath zones, and a Senecio-Lobelia alpine zone.
The woodland is derived from disturbance (Owiunji et al. 2005). Around 29% of the northerly section of MGNP was previously cropland but, in 1992, was taken out of cultivation and restored with indigenous trees (Butynski & Kalina 1993). There is some evidence of a higher frequency of exotic tree stands, particularly Eucalyptus sp. and Acacia mearnsii which were previously planted by the NFA, in these abandoned croplands. However, such species are infrequent throughout MGNP (Lejju et al. 2001, Owiunji et al. 2005).

Some of the montane forest is characterised as mixed, broadleaf montane forest, consisting of species such as Lepidotrichilia volkensii and Bersama abyssinica (Lejju et al. 2001). Only a small area of this forest, located at the base of Mt Muhabura, was untouched by previous encroachment (Owiunji et al. 2005). Above this is the second form of montane forest, bamboo forest, dominated by Oldeania alpina. This latter forest type is the most extensive within MGNP (Robbins et al. 2011). On Mount Sabiyinyo this habitat is below the Hagenia-Hypericum zone but it is above this zone on Mount Gahinga (Owiunji et al. 2005). Mount Gahinga is the youngest volcano of the three in MGNP, with a conical peak and swampy crater of approximately 180m in diameter, while there are swamps present elsewhere on the volcanoes including the Rugezi Swamp in the Gahinga-Sabyinyo saddle (Uganda Wildlife Authority 2007).

Conservation issues

Mgahinga Gorilla National Park was established in 1991 from the Gorilla Game Reserve and Mgahinga Forest Reserve. The establishment of this National Park led to the 1992 memorandum in which those who were farming a large northerly section of the park were relocated elsewhere (Butynski & Kalina 1993). Planting of indigenous species was then undertaken and, although there is some low-level presence of exotic tree species, canopy cover has steadily increased over the last three decades (Google Earth 2023).

A primary reason for the establishment of this National Park is the presence of Endangered Mountain Gorilla (Gorilla beringei subsp. beringei) which is known only from the Virunga mountains and Bwindi Impenetrable Forest globally (Hickey et al. 2020). This has benefited the forests in which they reside through conservation and restoration. Further, the management plan 2014-2024 recognizes that one of the ten "key conservation values" of the park is "habitat for endemic and endangered plants and animals", identifying bamboo forest and swamps as habitats of particular importance. The bamboo forests are associated with several range-restricted or threatened species, although several of these occur in grassy glades within the bamboo or in areas bordering the Hypericum-Hagenia zone, while swamp forest is associated with Swertia adolfi-friderici (VU). However, there are no named endemic and threatened plants, or strategies for protection of these species, included within the management plan and the document itself states that one challenge faced in ecological monitoring of the site is the "overemphasis on gorilla conservation at the expense of other species". The

designation of this site as an IPA, and accompanying evidence, could therefore prove useful and informative for future management of MGNP.

Within the regenerated woodland in the north of MGNP, located within a 1 km distance of the park boundary, land has been designated as a Collaborative Management Zone (Uganda Wildlife Authority 2014). Through negotiated collaborative management agreements, communities are able to sustainably harvest resources within resource use areas. There are still some ongoing threats to the conservation zones, however, such as grazing of livestock and setting of fires, often associated with refreshing pasture (Uganda Wildlife Authority 2014). Illegal extraction of bamboo, timber and firewood due to a lack of resources outside MGNP has also been recorded (Uganda Wildlife Authority 2014, CUPTD Workshop 2023).

Site assessor(s)

Sophie Richards, Royal Botanic Gardens, Kew

Iain Darbyshire, Royal Botanic Gardens, Kew

IPA criterion A species

SPECIES	QUALIFYING SUB-CRITERION	≥ 1% OF GLOBAL POPULATION	≥ 5% OF NATIONAL POPULATION	1 OF 5 BEST SITES NATIONALLY	ENTIRE GLOBAL POPULATION	SOCIO-ECONOMICALLY IMPORTANT	ABUNDANCE AT SITE
Afroligusticum runssoricum (Engl.) P.J.D.Winter	A(i)	✓	✓	✓	–	–	Unknown
Kniphofia bequaertii De Wild.	A(i)	✓	✓	✓	–	–	Unknown
Bothriocline ruwenzoriensis (S.Moore) C.Jeffrey	A(i)	✓	✓	✓	–	–	Unknown
Emilia pammicrocephala (S.Moore) C.Jeffrey	A(i)	✓	✓	✓	–	–	Unknown
Helichrysum mildbraedii Moeser	A(i)	✓	✓	✓	–	–	Unknown
Vernonia calvoana Hook.f. subsp. adolfi-friderici (Muschl.) C.Jeffrey	A(i)	✓	✓	✓	–	–	Unknown
Impatiens mildbraedii Gilg	A(i)	–	✓	✓	–	–	Unknown
Swertia adolfi-friderici Mildbr. & Gilg	A(i)	✓	✓	✓	–	–	Scarce
Ajuga leucantha Lukhoba	A(i)	–	✓	✓	–	–	Unknown
Leucas alluaudii Sacteux	A(i)	✓	✓	✓	–	–	Unknown
Crotalaria mesopontica Taub. subsp. glabrescens (R.Wilczek) Milne-Redh.	A(i)	✓	✓	✓	–	–	Unknown
Polystachya poikilantha Kraenzl. var. leucorhoda (Kraenzl.) P.J.Cribb & Podz.	A(i)	✓	✓	✓	–	–	Unknown
Pavetta urundensis Bremek.	A(i)	✓	✓	✓	–	–	Unknown
Pavetta	A(i)	✓	–	✓	–	–	Unknown

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
bagshawei S.Moore var. leucosphaera (Bremek.) Bridson							
Odontosoria africana F.Ballard	A(i)	✓	✓	✓	–	–	Unknown
Carpha angustissima Cherm.	A(i)	✓	✓	✓	–	–	Unknown

IPA criterion C qualifying habitats

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

General site habitats

GENERAL SITE HABITAT	PERCENT COVERAGE	IMPORTANCE
Forest - Subtropical/Tropical Moist Montane Forest	–	Major
Savanna - Moist Savanna	–	Minor
Shrubland - Subtropical/Tropical High Altitude Shrubland	–	Major
Forest - Subtropical/Tropical Swamp Forest	–	Minor
Rocky Areas - Rocky Areas [e.g. inland cliffs, mountain peaks]	–	Major
Grassland - Subtropical/Tropical High Altitude Grassland	–	Minor

Land use types

LAND USE TYPE	PERCENT COVERAGE	IMPORTANCE
Nature conservation	–	Major
Tourism / Recreation	–	Minor
Harvesting of wild resources	–	Minor

Threats

THREAT	SEVERITY	TIMING
Agriculture & aquaculture - Annual & perennial non-timber crops - Small-holder farming	Medium	Past, not likely to return
Agriculture & aquaculture - Wood & pulp plantations	Low	Past, not likely to return

THREAT	SEVERITY	TIMING
Climate change & severe weather - Habitat shifting & alteration	Unknown	Future - inferred threat
Agriculture & aquaculture - Livestock farming & ranching - Small-holder grazing, ranching or farming	Low	Ongoing - trend unknown
Natural system modifications - Fire & fire suppression - Increase in fire frequency/intensity	Low	Ongoing - trend unknown
Biological resource use - Gathering terrestrial plants	Low	Ongoing - trend unknown
Invasive & other problematic species, genes & diseases	Low	Ongoing - trend unknown

Protected areas

PROTECTED AREA NAME	PROTECTED AREA TYPE	RELATIONSHIP WITH IPA	AREAL OVERLAP
Mgahinga Gorilla National Park	National Park	protected/conservation area matches IPA	–

Conservation designation

DESIGNATION NAME	PROTECTED AREA	RELATIONSHIP WITH IPA	AREAL OVERLAP
Virunga Volcanoes	Key Biodiversity Area	protected/conservation area matches IPA	–
Virunga Volcanoes	Important Bird Area	protected/conservation area matches IPA	–

Management type

MANAGEMENT TYPE	DESCRIPTION	YEAR STARTED	YEAR FINISHED
Site management plan in place	Mgahinga Gorilla National Park General Management Plan 2014-2024	2014	2024

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