

# Rwenzori Mountains

## UGATIPA18

Country: **Uganda**

Administrative region: **Western (Region)**

Central co-ordinates: **0.38900 N, 29.97649 E**

Area: **2033.26km<sup>2</sup>**

### Qualifying IPA criteria

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

### IPA assessment rationale

The Rwenzori Mountains qualify as an IPA under all three IPA categories A, B and C. The presence of 22 threatened species, three Endangered and 19 Vulnerable, trigger sub-criterion A(i), while the presence of four highly restricted endemics and two range restricted endemics, currently unassessed for the IUCN Red List or assessed as Data Deficient, trigger A(iii) and A(iv) respectively. Criterion B(ii) is triggered by the exceptional botanical richness in endemic and range restricted taxa. Twenty-nine taxa are endemic or range restricted, representing 16% of the national list. Finally, criterion C(iii) is triggered by the presence of a nationally threatened habitat, Afroalpine rainforest, for which the Rwenzori Mountains represents the largest area nationally.

### Site description

The Rwenzori (or Ruwenzori) Mountains IPA covers the Rwenzori Mountains National Park and North Rwenzori Central Forest Reserve within the Ugandan part of the mountain range. The Rwenzori mountains form part of the international border with D.R. Congo and the peaks of five of the six mountains fall on the Ugandan side with the highest, Mount Stanley which reaches 5,109 m in altitude, representing the highest mountain in Uganda and the third highest in Africa. On the eastern side, the mountain rise gradually from the high Ugandan plateau, while in the west and northwest the mountains decline steeply towards Semuliki National Park. The IPA is of national and global importance, covering over 4000 m in altitude, including a range of nationally rare habitats, high levels of species endemism and one of only three glaciers present in Africa. Although of lower biodiversity value than Rwenzori Mountains National Park, North Rwenzori Central Forest Reserve is included within this IPA to provide the potential for a conservation corridor with Semuliki National Park.

### Botanical significance

The Rwenzori Mountains fall within the Eastern Afroalpine biodiversity hotspot. Isolated within this archipelago-like hotspot, the site displays high levels of endemism – 22 Rwenzori endemics are known from within this IPA. There is notable diversity within Asteraceae, including four *Senecio* taxa and *Dendrosenecio adnivalis* which comprises two subspecies, one of which has two varieties, all endemic to this mountain range. There are also four herbaceous species of *Alchemilla*, in the Rosaceae family, endemic to these mountains. While there are several cross-border endemics, some species are known at present from only the Ugandan side of the border including the sedge *Isolepis Rwenzoriensis* and the herbaceous perennial *Cardamine jonsellia*, both of which are only known from their type specimen, alongside *Senecio x pirottae*, a hybrid of *S. mattirolii* and *S. transmarinus*, which is known from several collections around the Kitandara Lakes. A possible fourth taxon only known from the Ugandan side of the mountains, *Asplenium* sp. "D586", is unresolved but may well represent an undescribed species (Beentje, 2008).

Although generally, narrow-range endemic species tend towards higher risk of extinction (Leão et al., 2023), many of the Rwenzori endemics are assessed as Least Concern, particularly those at higher altitudes which are less at risk from anthropogenic threats such as fire and timber harvesting. There is particular diversity within the high altitude Afroalpine zone where many of the Rwenzori endemics reside. However, these narrow range endemics may be at risk of climate change (see "conservation issues"), and further research into how range restricted species will be impacted by climate change would enable more accurate assessment for the IUCN Red List and may result in some of these species being recategorised as threatened with extinction.

There are currently 22 threatened taxa recorded from this IPA, three of which are Endangered and 19 Vulnerable. Common threats include habitat conversion and disturbance at other localities outside protected areas. While lower altitudes within the National Park still show some level of threat, much of this IPA is secure and is important for the conservation of many of these threatened species. *Afroligusticum elliotii* (EN), for instance, is threatened at several unprotected localities, including Rutshuru in the D.R. Congo where this species is threatened by coltan mining, and therefore the Rwenzori IPA is critical for preventing the extinction of this species (Amani et al., 2022).

Alongside threatened species, this IPA is the most important site for the nationally Endangered habitat, Afroalpine rainforest, large areas of which has been lost in Uganda, particularly in the Albertine Rift (Richards et al., In review). In addition, the high montane and Afroalpine habitats, including the ericaceous zone, *Alchemilla* zones and *Dendrosenecio* woodlands, are nationally rare and highly isolated from similar habitats, such as those on Mount Elgon and

the higher peaks of the Virunga Volcanos, and as a result represent unique communities where Rwenzori endemics such as *Dendrosenecio adnivalis* and *Alchemilla subnivalis* dominate habitats (Linder & Gehrke, 2005).

While much of the diversity within the site lies in the Rwenzori National Park, the Rwenzori North CFR provides an important habitat corridor between this National Park and Semuliki National Park at lower elevations. The site is more degraded than the neighbouring national parks, however, it has not yet been extensively surveyed and may well share plant species with these sites, or may have the capacity to do so if restored, and could help support increasing resilience by providing a conservation corridor (NFA, 2012).

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## Habitat and geology

The Rwenzori Mountains are unique among the high mountains of East Africa, which are of volcanic origin, as they are derived from an uplift of Precambrian basement rocks of granites, gneisses and amphibolites (Eggermont et al., 2009; Howard, 1991). Temperatures reach as low as -5°C in the nival zone and there is rainfall on the mountain most days, even in the dry season, with between 2,000 – 3,000 mm falling annually depending on altitude, making it one of the wettest places in Uganda (Howard, 1991).

Covering a wide range of altitudes, there is a gradient of different habitats within this IPA. The lowest areas fall within North Rwenzori CFR and have been categorised as a bushland and grassland mosaic with common tree species including *Acacia hockii*, *Bridelia scleroneura* and *Combretum guenzii* (NFA, 2012). Soils here are brown, gritty clay-loams, but at higher altitudes within this IPA are peaty-loams or peat of varying depths (Howard, 1991). From around 2,000 m, although often only beginning at the national park boundary, is a band of Afromontane rainforest dominated by *Albizia* spp., *Dombeya* spp., *Olea* spp., *Podocarpus milanjanus*, *Prunus africana* and *Symphonia globulifera* (Eggermont et al., 2009). This is the largest extent of Afromontane forest, which is nationally Endangered, in Uganda. In areas of disturbance, including landslides, the forest is replaced by open, low scrub (Lwanga, 1996). From around 2,500 m, these mixed Afromontane forests transition to bamboo forests, dominated by *Oldeania alpina* and featuring the Endangered species *Mimulopsis elliotii*. Langdale-Brown et al. (1964) describe the bamboo forest in a mosaic with *Hagenia abyssinica* and *Rapanea rhododendroides* (= *Myrsine melanophloeos*) forest. Above this zone is the Ericaceous heath characterised by species such as *Erica arborea*, *E. kingaensis*, *Hypericum bequaertii*, *H. revolutum* and epiphytic *Usnea* lichens (Eggermont et al., 2009; Lwanga, 1996). The ericaceous zone is important for range restricted species, including the Rwenzori endemic tree fern, *Gymnosphaera mildbraedii* (EN).

Above approximately 3,500 m is the alpine zone, consisting of a mosaic of habitats up to around 4,500 m where lichen covered rocks dominate non-glacial areas (Eggermont et al., 2009). These include upland bogs which are dominated by *Carex runssorensis* and, although this species is known from both the Rwenzori Mountains

and Mount Elgon in Uganda, these bogs are much more expansive within the Rwenzori (CUPTD Workshop, 2023) and include endemics to this mountain range such as the sedges *Carpha eminii* (VU), *Isolepis graminoides* and *I. Rwenzoriensis* (LC). The charismatic giant lobelias, including *Lobelia stuhlmannii* and *L. wollastonii*, also occur within these bogs. At these altitudes there are also a number of alpine lakes bordered by *C. runssorensis* (Eggermont et al., 2009). In areas of better drainage are open *Alchemilla* carpets. Below 4,000 m, *A. argyrophylla* dominates but above this, the Rwenzori endemic *A. subnivalis* dominates alongside *A. triphylla* and *A. stuhlmannii* which are both also known only from these mountains (Linder & Gehrke, 2005). Within ravines and other sheltered sites, *Dendrosenecio* or “giant senecio” woodland dominates. This rare habitat is dominated by the Rwenzori endemic *Dendrosenecio adnivalis*, alongside *D. erici-rosenii*, *Arabis alpina*, and *Senecio transmarinus* on drier slopes; two varieties of the lattermost species are Rwenzori endemics, while another endemic to these mountains, *Senecio mattirolii*, is found on scree slopes within the alpine zone (Linder & Gehrke, 2005).

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## Conservation issues

The Rwenzori Mountains IPA consists of two protected areas: North Rwenzori Central Forest Reserve (NRCFR), an L-shaped area of around 35 km<sup>2</sup> on the northern spur of the mountains first designated in 1940, and Rwenzori Mountains National Park (RMNP), first designated as a forest reserve in 1941 to include all areas above 2,100 m and subsequently upgraded to national park status in 1994 (Howard, 1991; UNEP-WCMC and IUCN, 2019). Across the border with D.R. Congo, RMNP is contiguous with Virunga National Park, while NRCFR meets Semuliki National Park at the base of the mountain in the Sempaya area.

NRCFR shows some agricultural encroachment, which occurred most recently during political upheaval in the region in the late 1990s and early 2000s, while grazing still continues within the site (NFA, 2012). Contrastingly, RMNP has a hard border with the surrounding agricultural landscape, demonstrating effective exclusion of these activities. Both sites are, however, threatened by timber extraction, fires and charcoal production, although this will only impact lower altitudes of the RMNP. Bamboo poles from the *Oldeania alpina* forests in RMNP are also extracted for construction. The area surrounding the IPA is one of the most densely populated rural areas nationally and, with populations increasing over recent years, pressure on the reserve has increased (Eilu, 2013; UWA, 2016). While many of the rare and endemic species are found at higher altitudes and are, as a result, not threatened with extinction, the lower altitude, and therefore more at risk, mixed montane and bamboo forest are important for conservation of all four of the Endangered species known from this site (see Botanical significance).

In addition to habitat disturbance and conversion, climate change and rising air temperatures present an imminent threat to the alpine environments of the Rwenzori Mountains. The glaciers at the highest altitudes have receded rapidly over the last century. Photographic evidence suggests that a decline began in at least the

1950s (Eilu et al., 2013). More recently, glacial extent receded from  $2.01 \pm 0.56$  km<sup>2</sup> in 1987 to  $0.96 \pm 0.34$  km<sup>2</sup> in 2003 and they are predicted to vanish completely within the next decade (Taylor et al., 2006). Glaciers are important sources of water, feeding streams and lakes in the mountains, and while the increased melt will initially increase water supply, this will decrease in time and potentially impact hydrology lower down the mountain (Eilu et al., 2013). An upward shift in *Senecio*, *Helichrysum* and *Erica* species has been reported in areas where de-glaciation has occurred (Oyana & Nakileza, 2016). In the long term, rising temperatures will likely pose a significant threat to the Afroalpine endemics of the Rwenzori. In the Bale Mountains of Ethiopia, also within the East Afroalpine biodiversity hotspot, modelling suggests that even in a 2°C warming scenario, the upper limit targeted by the Paris Climate Agreement, species dependent on the very cool temperatures around the plateau would be unable to tolerate warmer conditions caused by climate change and, with no remaining habitat left, face extinction (Kidane et al., 2019). More heat tolerant *Erica* spp., currently at the lower limit of the Afroalpine region, are predicted to colonise the highest altitudes of the Bale Mountains, the ecological impacts of which remain unknown. We may expect similar ecological changes and extinctions in the Rwenzori with rising global temperatures. More research and monitoring is required to understand the impacts of rising temperatures and to fully assess the future threat to the Rwenzori alpine endemics.

While global action on climate change is needed to prevent such extinctions, the two protected areas are working to minimise threats posed by local anthropogenic disturbance. In RMNP, there is a 1 km area along the Uganda-side boundaries designated as a collaborative resource use zone, where regulated resource use is allowed with a valid permit (UWA, 2016). In addition, 21.5 ha of *Pinus caribaea* was planted in NRCFR as part of plans to reforest grassland areas within this forest reserve with productive forests, including non-native species *P. caribaea* and *Eucalyptus grandis* on slopes and native species such as *Prunus africana* and *Terminalia brownii* (NFA, 2012). Valley bottoms will be planted with native species only. Reforestation of these cleared slopes will likely stabilise soils and the small area (150 ha) designated for community use could help ease pressure on natural forests. However, harvesting of trees should be ecologically sensitive to ensure that natural forest is not impacted, while the loss of agricultural land may cause conflict with local communities and could increase pressure on land and resources if alternative livelihoods are not provided. While the management of NRCFR largely focusses on productive forests, management of RMNP is instead focused on biodiversity conservation. Provision of habitat for “rare, endangered and endemic plant and animal species” is one of the key values identified within the management plan. However, only a limited number of range-restricted and endemic plants have been identified within this plan. There are several species with ranges under 10,000 km<sup>2</sup>, many of which are endemic to the Rwenzori, that are not included within the report annex, while two species were wrongly recognized as Rwenzori endemics (*Hypericum bequaertii*, which is also known from Mount Elgon, and *Schefflera polysciadia* which is now under the name *Astropanax polysciadus*, a species that is from several

countries in central and east Africa). The recognition of this site as an Important Plant Area is therefore a positive step in refocusing efforts towards priority plant species and improving their conservation at the site.

As well as importance for plant species, the RMNP has been designated a Key Biodiversity Area based on the presence of several threatened and geographically restricted animals alongside qualifying plant species. Rwenzori Red Duiker (*Cephalophus nigrifrons* subsp. *rubidus*), Montane Mouse Shrew (*Myosorex blarina*) and Montane Shaggy Rat (*Dasymys montanus*) are three Endangered mammal species endemic to the Rwenzori mountains (Plumptre et al., 2019). The site has also been recognised as an Important Bird Area, as one of the richest sites for Albertine Rift endemic birds in the IBA network of Uganda, and a UNESCO World Heritage site for containing “superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance” and “the most important and significant natural habitats for in-situ conservation of biological diversity” (BirdLife International, 2023; UNESCO, 2023). In addition, the presence of upland bogs associated with rare plant species such as *Helichrysum stuhlmanni* and *Carex runssoroensis* contributes to the designation of this site as a Ramsar site (UWA & Ministry of Water and Environment, 2008). The designation of this site as an IPA further bolsters the Rwenzori Mountain’s status as a site of global significance for conservation.

## IPA criterion A species

SPECIES	QUALIFYING SUB-CRITERION	≥ 1% OF GLOBAL POPULATION	≥ 5% OF NATIONAL POPULATION	1 OF 5 BEST SITES NATIONALLY	ENTIRE GLOBAL POPULATION	SOCIO-ECONOMICALLY IMPORTANT	ABUNDANCE AT SITE
<i>Mimulopsis elliotii</i> C.B.Clarke	A(i)	✓	✓	✓	–	–	Unknown
<i>Mimulopsis excellens</i> Lindau	A(i)	✓	✓	✓	–	–	Unknown
<i>Brachystephanus glaberrimus</i> Champl.	A(i)	✓	✓	✓	–	–	Unknown
<i>Afroligusticum elliotii</i> (Engl.) C.Norman	A(i)	✓	✓	✓	–	–	Unknown
<i>Afroligusticum runssoricum</i> (Engl.) P.J.D.Winter	A(i)	✓	✓	✓	–	–	Unknown
<i>Dracaena subtilis</i> (N.E.Br.) Byng & Christenh.	A(iii)	✓	✓	✓	–	–	Unknown
<i>Asplenium ruwenzoriense</i> Baker	A(iii)	✓	✓	✓	✓	–	Unknown
<i>Senecio transmarinus</i> S.Moore var. major C.Jeffrey	A(iii)	✓	✓	✓	✓	–	Unknown
<i>Senecio transmarinus</i> S.Moore var. sycephalus (S.Moore) Hedberg	A(iv)	✓	✓	✓	–	–	Unknown
<i>Helichrysum mildbraedii</i> Moeser	A(i)	✓	✓	✓	–	–	Unknown
<i>Bothriocline ruwenzoriensis</i> (S.Moore) C.Jeffrey	A(i)	✓	✓	✓	–	–	Unknown
<i>Impatiens mildbraedii</i> Gilg	A(i)	✓	✓	✓	–	–	Unknown
<i>Gymnosphaera mildbraedii</i> (Brause) S.Y.Dong	A(i)	✓	✓	✓	–	–	Unknown
<i>Faroa graveolens</i> Baker	A(i)	–	–	–	–	–	Unknown
<i>Carpha eminii</i> (K.Schum.)	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
<i>C.B.Clarke</i>							
<i>Leucas alluaudii</i> Sacteux	A(i)	✓	✓	✓	–	–	Unknown
<i>Crotalaria adenocarpoides</i> Taub.	A(i)	✓	✓	✓	–	–	Unknown
<i>Englerina schubotziana</i> (Engl. & K.Krause) Polhill & Wiens	A(i)	✓	✓	✓	–	–	Unknown
<i>Tridactyle virgula</i> (Kraenzl.) Schltr.	A(i)	✓	✓	✓	–	–	Unknown
<i>Rhipidoglossum bilobatum</i> (Summerh.) Szlach. & Olszewski	A(i)	✓	✓	✓	–	–	Unknown
<i>Polystachya nyanzensis</i> Rendle	A(i)	✓	✓	✓	–	–	Unknown
<i>Polystachya woosnamii</i> Rendle var. <i>woosnamii</i>	A(i)	✓	✓	✓	–	–	Unknown
<i>Bulbophyllum vulcanicum</i> Kraenzl.	A(i)	✓	✓	✓	–	–	Unknown
<i>Deschampsia angusta</i> Stapf & C.E.Hubb.	A(i)	✓	✓	✓	–	–	Frequent
<i>Prunus africana</i> (Hook.f.) Kalkman	A(i)	–	–	✓	–	–	Frequent
<i>Rytigynia ruwenzoriensis</i> (De Wild.) Robyns	A(i)	✓	✓	✓	–	–	Frequent
<i>Dendrosenecio adnivalis</i> subsp. <i>adnivalis</i> var. <i>adnivalis</i>	A(iv)	✓	✓	✓	–	–	Unknown
<i>Dendrosenecio adnivalis</i> subsp. <i>adnivalis</i> var. <i>petiolatus</i>	A(iii)	✓	✓	✓	–	–	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
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## 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
Grassland - Subtropical/Tropical High Altitude Grassland	—	Major
Wetlands (inland) - Permanent Freshwater Marshes/Pools [under 8 ha]	—	Minor
Rocky Areas - Rocky Areas [e.g. inland cliffs, mountain peaks]	—	Major

## Land use types

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

## Threats

THREAT	SEVERITY	TIMING
Human intrusions & disturbance - War, civil unrest & military exercises	Medium	Past, not likely to return
Agriculture & aquaculture - Annual & perennial non-timber crops - Small-holder farming	Low	Ongoing - stable
Agriculture & aquaculture - Livestock farming & ranching - Small-holder grazing, ranching or farming	Low	Ongoing - stable
Biological resource use - Gathering terrestrial plants	Low	Ongoing - stable
Invasive & other problematic species, genes & diseases - Invasive non-native/alien species/diseases	Medium	Ongoing - increasing
Climate change & severe weather - Habitat shifting & alteration	High	Ongoing - increasing
Biological resource use - Logging & wood harvesting	Medium	Ongoing - trend unknown
Natural system modifications - Fire & fire suppression - Increase in fire frequency/intensity	Medium	Ongoing - trend unknown

## Protected areas

PROTECTED AREA NAME	PROTECTED AREA TYPE	RELATIONSHIP WITH IPA	AREAL OVERLAP
Rwenzori Mountains National Park	National Park	IPA encompasses protected/conservation area	996
North Rwenzori Central Forest Reserve	Forest Reserve (production)	IPA encompasses protected/conservation area	35

## Conservation designation

DESIGNATION NAME	PROTECTED AREA	RELATIONSHIP WITH IPA	AREAL OVERLAP
Rwenzori Mountains	Ramsar	protected/conservation area encompasses IPA	995
Rwenzori Mountains National Park	UNESCO World Heritage Site	protected/conservation area encompasses IPA	995
Ruwenzori Mountains National Park	Alliance for Zero Extinction Site	protected/conservation area encompasses IPA	995
Ruwenzori (Rwenzori) Mountains National Park	Important Bird Area	IPA encompasses protected/conservation area	995
Ruwenzori Mountains National Park	Key Biodiversity Area	IPA encompasses protected/conservation area	995

## Management type

MANAGEMENT TYPE	DESCRIPTION	YEAR STARTED	YEAR FINISHED
Site management plan in place	Rwenzori Mountains National Park General Management Plan 2016-2025	2016	2025

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