

# Mount Moroto

## UGATIPA15

Country: **Uganda**

Administrative region: **Northern (Region)**

Central co-ordinates: **34.78504 N, 2.53627 E**

Area: **483km<sup>2</sup>**

### Qualifying IPA criteria

A(i), B(ii)

### IPA assessment rationale

Mount Moroto qualifies as an IPA under subcriteria A(i), B(ii) and C(iii). Under A(i), there are five taxa globally threatened with extinction, three Endangered and two Vulnerable, while B(ii) is triggered by seven endemic or range restricted species, equivalent to over 4% of the national list of endemic or range restricted species. For two of these plant taxa, *Senecio morotonensis* and *Trifolium masaiense* subsp. *morotoense*, this site incorporates their entire global populations and so is of great conservation significance. Finally, C(iii) pertaining to a significant area of threatened habitat at the site, is triggered by the presence of Afromontane undifferentiated forest, a nationally Vulnerable habitat. This IPA has 13% of the national resource and is one of the five best sites nationally for this habitat.

### Site description

Mount Moroto is a Central Forest Reserve (CFR) of 483 km<sup>2</sup> located in the Moroto District, northeast Uganda. The site follows the Kenya – Uganda border for around 30 km at its eastern boundary, while Moroto Town is situated at the western foot of the mountain. The mountain itself is a Miocene volcanic mass arising from the Eastern Rift escarpment and reaching a peak of 3083 m in altitude (Howard 1991, Nanyunja 2003). Indigenous Tepeth communities live on the mountain and are dependent upon the ecosystem services it provides (Nanyunja 2003).

### Botanical significance

Mount Moroto is a globally significant site for plant conservation, hosting many rare plant taxa. Two of these, *Senecio morotonensis* and *Trifolium masaiense* subsp. *morotoense* are endemic to this IPA. Neither are thought to be at risk of extinction currently, as they occur at higher altitudes where human activities are minimal. However, as the only site globally for these taxa, it is important that future activities within the CFR do not put these unique populations

at risk.

Several other species known from this IPA are range restricted. Two herbaceous species, *Drimys congesta* and *Trifolium lugardii*, are known only from this site and Mount Elgon. Both are globally Endangered, occurring on the lower slopes of Mount Elgon where they are threatened by habitat degradation (Phillips et al., In Press., Amani et al. 2022). Others are similarly limited to a few sites in northeastern Uganda and in adjacent sites beyond the country's borders. *Aloe wilsonii* (VU) and *Aloe cheranganiensis* (LC), for instance, are only known from a small number of sites either side of the Kenya – Uganda border north of Mount Elgon, while *Justicia afromontana* (LC) and *Bothriocline monticola* (EN) are each limited to this same stretch of border in addition to the Imatong Mountains in South Sudan.

This site is notable for its diversity of *Aloe* species, with five species present. Alongside the aforementioned two, *Aloe tweedieae* (LC), *A. wollastonii* and *A. wrefordii* (LC) are known from Mount Moroto, with the lattermost described as “one of the least common of Uganda's aloes” (Cole & Forrest 2017), known only from this site nationally. Collected on the lower slopes of this mountain, there are two populations of *A. wrefordii* at this site, one 19 km southeast of Moroto town and another growing near Rupa on the northern boundary of this IPA. It is notable that, despite being previously assessed as Least Concern, both of these sites appear very close to mining activities. Quarries were opened near the southeasterly population as recently as 2023 (Google Earth 2023). Reassessment of this species may well find it to be Endangered, given this significant threat and the species' limited range, extending only from Mount Moroto to the contested Ilemi Triangle area.

While several of the *Aloe* species have benefited from more recent surveying, particularly related to “Aloes of Uganda: A Field guide” (Cole & Forrest 2017), the flora of Mount Moroto is otherwise understudied, with several species most recently collected in the 1960s. There have been some subsequent surveys, notably the Biodiversity report for Moroto, Napak and Kadam (Lwanga 1996), but this report focused primarily on shrubs and trees, while the plants of conservation significance within this IPA are primarily herbaceous. Further surveys would be beneficial, to further understanding of these species and provide more up to date information for conservation, while such surveys may also reveal additional plants of conservation importance.

In addition to species of conservation importance, Mount Moroto is one of the best sites in Uganda for nationally Vulnerable habitat Afromontane undifferentiated forest. Representing around 13% of the national resource of this habitat type, this IPA triggers criterion C(iii) for hosting significant areas of this threatened habitat.

## Habitat and geology

Moroto experiences one rainy season from April to December, with annual rainfall of only 887 mm (Nanyunja 2003, Kamukasa Adonia 2015). With highly limited rainfall, the montane forests are likely dependent on mists to supply moisture. Much of the site is dominated by Afromontane undifferentiated forest, a nationally threatened, drier montane forest type which on Mount Moroto characterised by valuable timber trees *Podocarpus milanjanus*, *Afrocarpus* (*Podocarpus*) *gracilior*, and *Juniperus procera* (Langdale-Brown et al. 1964; Lwanga 1996; Katende & Lye #410). This habitat is dominant at altitudes above ca. 2000 m, although extends below this in some sheltered ravines. At the highest peaks of the mountain, habitat transitions to open grassland, providing important habitat for species such as Endangered *Bothriocline monticola* and *Trifolium lugardii* and the Moroto endemic *Senecio morotonensis*.

Below the forests are areas of savanna where species such as *Acacia* (*Vachellia*) *hockii* and *Combretum molle* are noted to be dominant (Lwanga 1996). Langdale-Brown et al. (1964) show a transition of this savanna into *Acacia-Comiphora* bushland at lower altitudes in the west of the CFR. The steeper eastern cliffs, with exposed and rocky ground cover, likely provides good habitat range-restricted *Aloe cheranganiensis* alongside other succulents.

Significant areas of the reserve, particularly at lower altitudes in the north and south, have been transformed by farming of crops.

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## Conservation issues

Mount Moroto was designated as a Central Forest Reserve in 1948. The site has been identified as a Key Biodiversity Area (KBA), due to the presence of *Aloe wrefordii*, a geographically restricted species under KBA criteria (Plumptre et al. 2019). Mount Moroto is also an Important Bird Area, with bird communities showing a greater affinity to northwestern Kenya than the avifauna elsewhere in Uganda; several bird species from Mount Moroto are not known from any other protected area or IBA in Uganda (BirdLife International 2023).

The site is very significant to Tepeth communities, many of which settled at high altitudes, up to 2000 m, to avoid interethnic conflicts in the area (Kamukasa Adonia 2015, Google Earth 2023). While the 1990s saw the eviction of communities from CFRs across Uganda, there was resistance to this at Mount Moroto. However, there has traditionally been a culture of sustainability within Tepeth communities, for example, significant plants associated with ecosystem services such as food provision, medicines, climate regulation and spiritual importance were traditionally not cut without consultation of beneficiaries in the community (Nanyunja 2003). Such traditions may well have limited the impact of these communities on the reserve.

However, a decrease in *Aloe* spp. abundance has been noted over recent decades, with plants frequently used by Tepeth communities for medicinal purposes (Nanyunja 2003). Further research is needed to establish which species are being used and for which ailments, to

establish whether rare and threatened species are negatively impacted and to what extent more common *Aloe* species could be used instead.

Commercialization of forest resources, mining and a push by government to abandon nomadic pastoralism in favour of arable farming across Karamoja are thought to have increased pressure on the habitats of Mount Moroto CFR (The New Humanitarian 2014, Kamukasa Adonia 2015). It has been suggested that the latter initiative, the Karamoja Action Plan for Food Security (2009-2014), led directly to the establishment of crop farming within the CFR (Kamukasa Adonia 2015). Farming has led to increased, uncontrolled burning for land clearance and has also come into direct conflict with cattle grazing, forcing pastoralists to higher altitudes (Kamukasa Adonia 2015). In addition, harvesting of timber for construction is common, while charcoal burning largely targets *Acacia* spp. and is primarily sold to people in Moroto town and elsewhere (Kamukasa Adonia 2015). Other key issues are that there has been a lack of regulation of activities by the NFA, on-the-ground monitoring is scarce and licenses to allow for legal access of forest resources, particularly timber, have not been issued (Kamukasa Adonia 2015).

In addition to this, the NFA had advertised a bid notice to harvest pine and eucalyptus trees from a 50 hectare plot planted by the British in 1940s, known as Elipas forest, on the upper slopes of Mount Moroto (Eninu 2017a). Local resistance, due to the forest's importance for livelihoods and spiritual importance to Tepeth communities, led to the abandonment of these plans in 2017. However, the NFA has suggested that it may reattempt harvesting of this plot at a later date with a focus on community engagement and tree planting in the meantime to assuage community objections (Eninu 2017b). While these trees do not form part of the natural forest community, logging may well cause disturbance to primary vegetation, through access creation and if unregulated felling encroaches on natural stands, and the loss of Elipas may well increase pressure on forest resources elsewhere in the CFR. Mining is also a major threat to the site. There has been great interest in marble extraction, the latter linked with supplying cement factories in Tororo (New Vision 2019). Much of these mining activities are artisanal and, as such, are not preceded by Environment Impact Assessments with no obligation to restore abandoned mining sites (Kamukasa Adonia 2015, New Vision 2019). Satellite imagery suggests that new mining sites have been established as recently as 2023 (Google Earth 2023) and may well pose a threat to rare species at this site (see "Botanical Significance").

However, there have been some conservation successes at the site. Since June 2022, it has been one of the focal sites for conservation efforts by the Kara-Tunga Foundation (KTF), a not-for-profit organisation linked with the Kara-Tunga tour operator (World Land Trust 2023). A 1,500 ha area within the CFR will be managed by KTF for reforestation, ecotourism and other conservation activities. A further core conservation zone of 5 ha on the reserve boundary has been bought by KTF, with 3 ha of this hosting ecotourism activities and acting as a hub for coordinating agroforestry and conservation efforts, such as tree planting, that will be undertaken in a 2,500 ha

community-owned buffer zone surrounding this core zone (World Land Trust 2023).

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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
<i>Drimia congesta</i> Bullock	A(i)	✓	✓	✓	—	—	Unknown
<i>Aloe wilsonii</i> Reynolds	A(i)	✓	✓	✓	—	—	Unknown
<i>Bothriocline monticola</i> (M. Taylor) Wech.	A(i)	✓	✓	✓	—	—	Unknown
<i>Trifolium lugardii</i> Bullock	A(i)	✓	✓	✓	—	—	Unknown
<i>Ansellia africana</i> Lindl.	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
Afromontane dry forest (VU)	C(iii)				30.8

## General site habitats

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

## Land use types

LAND USE TYPE	PERCENT COVERAGE	IMPORTANCE
Nature conservation	—	Major
Agriculture (arable)	—	Major
Agriculture (pastoral)	—	Unknown
Tourism / Recreation	—	Minor
Extractive industry	—	Minor
Residential / urban development	—	Minor

LAND USE TYPE	PERCENT COVERAGE	IMPORTANCE
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## Threats

THREAT	SEVERITY	TIMING
Biological resource use - Logging & wood harvesting	Medium	Ongoing - stable
Biological resource use - Gathering terrestrial plants	Low	Ongoing - stable
Residential & commercial development - Housing & urban areas	Medium	Ongoing - increasing
Agriculture & aquaculture - Annual & perennial non-timber crops - Small-holder farming	High	Ongoing - increasing
Energy production & mining - Mining & quarrying	Medium	Ongoing - increasing
Transportation & service corridors - Roads & railroads	Medium	Ongoing - increasing
Natural system modifications - Fire & fire suppression - Increase in fire frequency/intensity	High	Ongoing - increasing
Agriculture & aquaculture - Wood & pulp plantations - Agro-industry plantations	Medium	Future - planned activity
Agriculture & aquaculture - Livestock farming & ranching - Nomadic grazing	Unknown	Ongoing - trend unknown

## Protected areas

PROTECTED AREA NAME	PROTECTED AREA TYPE	RELATIONSHIP WITH IPA	AREAL OVERLAP
Mount Moroto Central Forest Reserve	Forest Reserve (conservation)	protected/conservation area matches IPA	483

## Conservation designation

DESIGNATION NAME	PROTECTED AREA	RELATIONSHIP WITH IPA	AREAL OVERLAP
Mount Moroto Forest Reserve	Key Biodiversity Area	protected/conservation area matches IPA	483
Mount Moroto Forest Reserve	Important Bird Area	protected/conservation area matches IPA	483

## Management type

MANAGEMENT TYPE	DESCRIPTION	YEAR STARTED	YEAR FINISHED
No management plan in place		—	—

## Bibliography

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