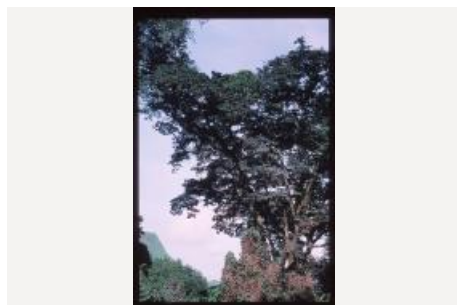
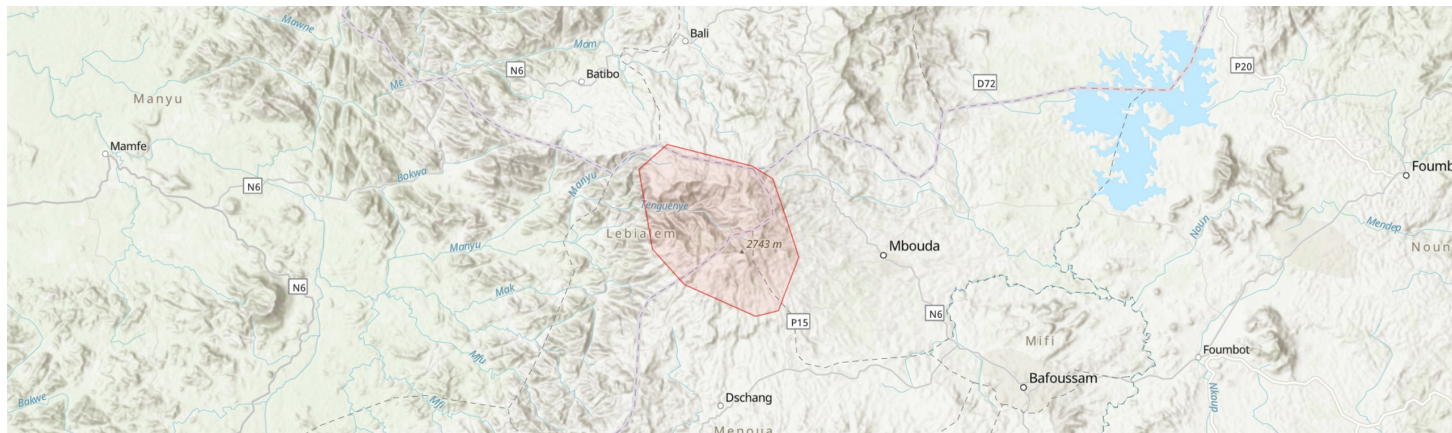


Mount Bamboutos

Mont Meleta (Test version)

CMNTIPA021



Country: **Cameroon**

Administrative region: **West (Region)**

Central co-ordinates: **5.63700 N, 10.08700 E**

Area: **340km²**

Qualifying IPA criteria

A(i)

IPA assessment rationale

Mount Bamboutos potentially qualifies as an IPA on the basis of past collections of multiple threatened species. However, it is not known if most of these still survive in the area and if they do it is likely to be so in the western part and the caldera, or perhaps in remnant hedges and forest fragments. Herbaceous species are more likely to survive in grassland and scrubby areas on the eastern side.

Site description

Mount Bamboutos is located at the juncture of West, Southwest and Northwest regions, Cameroon. It is the third highest point in the country after Mount Cameroon and Mount Oku, and like those peaks

it is part of the Cameroon Line of volcanoes which extends northwest from the Gulf of Guinea and continues beyond Mount Bamboutos as the Bamenda highlands. The area identified here lies within West and Southwest Regions, with a huge caldera at the centre. To the north, south and east the land slopes away gradually from the rim of the caldera forming a high plateau that is heavily populated and cultivated. The western side is much steeper and more forested, dropping rapidly 2.5 km in height to the valley below. The proposed area is a preliminary demarcation based on historical records of botanical significance. Further surveys and consultation will be required to demarcate an actual area where important taxa remain amidst the mostly degraded landscape.

Botanical significance

Mount Bamboutos and the neighbouring plateau has been a focus for Western botanical collecting since the nineteenth century and there are many records of species which are now threatened with extinction. However, it is also one of the most populated areas of Cameroon and has been densely grazed and farmed with extensive loss of forest. Most of the historically recorded taxa were collected from areas that now have no forest remaining, only hedges and patches of trees and savannah (Cayet-Boisrobert, 2020). It is not known how many of these species survive in this fragmented habitat or in the remaining forested parts on the western side. The exceptionally rare, critically endangered and medicinal plant,

Ternstroemia cameroonensis, originally collected at this site by Letouzey, is currently thought to only survive at one location within this site, having apparently become extinct at Mt Oku (Cheek et al., 2017). *Vepris montisbambutensis* (CR) is known only from the type collected here in 1974. *Clerodendrum singwanum* is known only from the Ledermann collections in 1908 probably lost in the Berlin herbarium fire.

Habitat and geology

The upper slopes of Mount Bamboutos, constituting the area under consideration, are dominated by acidic volcanic rocks such as trachytes, phonolites, rhyolites and tuffs. (Ngoufo, 1992). Soils are generally acidic but varied, with widespread lithosols and rankers but also fertile soils rich in dark humus (Ngoufo 1992). Although these highlands soils have been worked for agriculture for far less time than the lower plateau, they are highly vulnerable to erosion and leaching due to the steep gradients, high precipitation and loss of vegetation (Ngoufo 1992).

Precipitation probably varies considerably across the site due to altitude and the rain shadow effect. Mean annual precipitation at Bamenda to the north was 2260 mm between 1971-2000 (WMO, 2020) but at Dschang, south of the summit, was 1873 ±209 mm between 1910 and 2000 (Kengni et al., 2009). Both these stations are around 1400 m below the summit of Mount Bamboutos. Kengni et al. (2009) recorded a total of 2507 mm over 1 year (2002-3) at the Mélétan station (2608 m). Precipitation is strongly seasonal, with the steep western slopes intercepting the humid Atlantic monsoon winds; 75% of annual precipitation occurs between June and October, and 50% between July and September (WMO, 2020; Ngoufo, 1992). November, December and January are the driest months, with virtually no rain falling in some areas in the east (Ngoufo, 1992). Mean temperatures vary relatively little at lower altitudes (e.g. Bamenda max 22.1-26.8 °C, min 13.1-16.7 °C) but even at 2000 m morning temperatures may drop to zero °C in the dry cold months of November-February.

While probably originally forested, the high Bamboutos area has long borne the imprint of human civilisation. Colonial era maps suggest livestock grazing resulted in savanna of trees or shrubs as well as areas of grassland, with forest remaining only in valleys, steep slopes and along rivers (Ngoufo, 1992; Cayet-Boisrobert, 2020). However, since the 1970s, increasing population pressure and impoverishment of soils in the piedmont area, as well as opportunities for cash crops suited to higher altitude, have led to cultivation and further loss of semi-natural vegetation even at high altitudes, with increased pressure on reduced area of grazing lands, increased fire, and soil erosion from cultivation of even steep slopes (Ngoufo, 1992; Tchassem et al 2019).

Conservation issues

There has been almost complete loss of forest on the northern and eastern slopes of Mount Bamboutos under intense agricultural and population pressure (Ngoufo, 1992; Cayet-Boisrobert, 2020;

Tchassem et al., 2019). While it is possible that threatened tree species hang on in hedges or isolated clumps, the extent of development, with large settlements visible on the summit rim itself at 2600 m, make conservation very challenging on this side of the mountain. The small Mount Bamboutos Forest Reserve was already fully degraded from forest to savanna vegetation by 1957 (Cayet-Boisrobert, 2020). Patches of forest are visible still on satellite imagery (Google Earth, 2020 – most recent images April 2020) and may represent small areas that could be considered a salvageable IPA but ground truthing is rapidly required to assess these.

Fire, grazing, agricultural cultivation and soil erosion, including landslides are the main conservation issues. Conflicts exist between traditional livestock grazing and subsistence farming at high altitudes by mainly Fulani (Mbororo) peoples and upwards pressure from Bamilike Mbouda groups growing a new diverse range of garden cash crops such as carrots, cabbage and potatoes as well as oil palm and cocoa (Ngoufo, 1992; Tchassem et al., 2019; Toh et al., 2018). Cultivation of steep slopes, shortened fallowing, increased fire and loss of natural vegetation has resulted in rapid loss of previously fertile, humus-rich high altitude soils and major landslides. Even on the south western slopes and within the caldera valley, there is alarming loss of hitherto better preserved forest with associated erosion and landslides (Toh et al., 2018).

Mount Bamboutos is also a major watershed and habitat conversion and irrigation has resulted in drying up of streams while pollution, sedimentation and nutrient enrichment also result from the intense agricultural use of the land (Ngoufo, 1992; Cayet-Boisrobert, 2020). The NGO ERuDeF is active in the area and has instigated tree-planting including native species such as *Prunus Africana* which was eliminated through over-harvesting in the 1990s (Greenvision, 2020). The organisation also promotes more sustainable agricultural methods, hydrological conservation, sustainable income generation and habitat corridors (Cayet-Boisrobert, 2020). Restoration work and surveying is also being funded by ZSL EDGE, focused particularly on amphibians and reptiles, and by the International Tree Foundation (T. Doherty-Bone, 2022, pers. comm. 4 Jan).

Site assessor(s)

Bruce Murphy, Royal Botanic Gardens, Kew

Jean Michel Onana, University of Yaounde I, Faculty of Science, Department of Plant Biology; IRAD-Herbier National Camerounais

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>Aeollanthus trifidus</i> Ryding	A(i), A(ii), A(iii)	✓	✓	✓	–	–	
<i>Bidens mannii</i> T.G.J.Rayner	A(i)	✓	–	–	–	–	
<i>Dipsacus narcissaeus</i> Lawalrée	A(i)	✓	✓	✓	–	–	
<i>Dissotis bamendae</i> Brenan & Keay	A(i)	✓	✓	–	–	✓	
<i>Eugenia gilgii</i> Engl. & Brehme	A(i)	✓	✓	✓	–	–	
<i>Lefebvrea camerunensis</i> (Jacq.-Fél.) Cheek & I.Darbysh.	A(i)	✓	–	✓	–	–	
<i>Lobelia columnaris</i> Hook.f.	A(i)	✓	–	✓	–	–	
<i>Rhabdotosperma densifolia</i> (Hook.f.) Hartl	A(i)	✓	–	✓	–	–	
<i>Rhabdotosperma ledermannii</i> (Murb.) Hartl	A(i)	✓	✓	–	–	–	
<i>Schefflera mannii</i> (Hook.f.) Harms	A(i)	✓	–	–	–	–	
<i>Orbivestus bamendae</i> (C.D.Adams) Isawumi	A(i)	–	–	–	–	–	
<i>Morella arborea</i> (Hutch.) Cheek	A(i)	✓	✓	–	–	–	
<i>Phylloentas ledermannii</i> (K.Krause) Kârehed & B.Bremer	A(i)	✓	✓	–	–	–	
<i>Afrologisticum townsendii</i> (Charpin & Fern.Casas) P.J.D.Winter	A(i)	✓	✓	✓	–	–	
<i>Andropogon pusillus</i> Hook.f.	A(i)	✓	✓	✓	–	–	

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>Clusia kamerunica</i> Pax	A(i)	✓	✓	✓	–	–	
<i>Eragrostis camerunensis</i> W.D.Clayton	A(i)	✓	–	✓	–	–	
<i>Gnidia bambutana</i> Gilg & Ledermann ex Engl.	A(i)	✓	✓	✓	–	–	
<i>Phyllanthus caligatus</i> Jean F.Brunel & Jacq.Roux	A(i)	✓	✓	✓	–	–	
<i>Platycoryne megalorrhyncha</i> Summerh.	A(i)	✓	✓	✓	–	–	
<i>Ternstroemia cameroonensis</i> Cheek	A(i), A(iii)	✓	✓	✓	–	✓	
<i>Isoglossa nervosa</i> C.B.Clarke	A(i)	–	–	✓	–	–	
<i>Vepris montisbambutensis</i> Onana	A(i), A(iii), A(iv)	✓	✓	✓	–	–	
<i>Coleus maculosus</i> (Lam) A.J.Paton subsp. <i>lanatus</i> (J.K.Morton) A.J.Paton	A(i)	✓	✓	✓	–	–	
<i>Stachys pseudohumifusa</i> subsp. <i>saxeri</i>	A(i)	–	–	✓	–	–	
<i>Clerodendrum singwanum</i> B.Thomas	A(iii)	✓	✓	✓	✓	–	

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	–	
Grassland - Subtropical/Tropical High Altitude Grassland	–	

Land use types

LAND USE TYPE	PERCENT COVERAGE	IMPORTANCE
Agriculture (arable)	—	Major
Agriculture (pastoral)	—	Minor

Threats

THREAT	SEVERITY	TIMING
Biological resource use - Gathering terrestrial plants - Intentional use (species being assessed is the target)	Low	Past, likely to return
Residential & commercial development - Housing & urban areas	Medium	Ongoing - increasing
Agriculture & aquaculture - Annual & perennial non-timber crops - Small-holder farming	High	Ongoing - increasing
Agriculture & aquaculture - Annual & perennial non-timber crops - Shifting agriculture	High	Ongoing - increasing
Agriculture & aquaculture - Livestock farming & ranching - Small-holder grazing, ranching or farming	High	Ongoing - increasing
Natural system modifications - Dams & water management/use - Abstraction of ground water (agricultural use)	Medium	Ongoing - increasing
Pollution - Agricultural & forestry effluents - Soil erosion, sedimentation	Medium	Ongoing - increasing
Geological events - Avalanches/landslides	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
Pollution - Agricultural & forestry effluents - Herbicides and pesticides	Medium	Ongoing - trend unknown

Protected areas

PROTECTED AREA NAME	PROTECTED AREA TYPE	RELATIONSHIP WITH IPA	AREAL OVERLAP
Mount Bamboutos Forest Reserve	Forest Reserve (production)	IPA encompasses protected/conservation area	5

Conservation designation

DESIGNATION NAME	PROTECTED AREA	RELATIONSHIP WITH IPA	AREAL OVERLAP
Bamboutos Mountains	Important Bird Area	protected/conservation area overlaps with IPA	—
Bamboutos Mountains	Key Biodiversity Area	protected/conservation area overlaps with IPA	—
Bamboutos Mountains	Alliance for Zero Extinction Site	protected/conservation area overlaps with IPA	—

Management type

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

Bibliography

Cheek, M., Tchiengue, B., Tacham, W.N. 2017. **Ternstroemia cameroonensis (Ternstroemiaceae), a new medicinally important species of montane tree, nearly extinct in the Highlands of Cameroon.** Blumea, Vol 62(1), page(s) 53-57

Cayet-Boisrobert, Lauriane 2020. **Cameroon: Trees, water, soil and endangered wildlife.**

International Tree Foundation 2020. **Mount Bamboutos Initiative.**

Kengni, Lucas, Tekoudjou, H., Tematio, P., Pamo Tedonkeng, E., and Tankou, C., Lucas, Y. & Probst, J-L. 2009. **Rainfall Variability along the Southern Flank of the Bambouto Mountain (West-Cameroon)..** Journal of the Cameroon academy of sciences, Vol 8(1), page(s) 45-52

Tchassem, A.M, Doherty-Bone, T.M, Kamenin, M.M., Tapondjoun, W.P., Tamesse, J.L. & Gonwouo, L.N. 2019. **What is driving declines of montane endemic amphibians? New insights from Mount Bamboutos, Cameroon..** Oryx, 1-11, page(s) 1-11

Shancho Ndimuh, B. 2017. **Discover Mt Bamboutos: Cameroon's Key Watershed with High Diversity Undergoing Depletion.**

Focho, D. A., Ndam, W. T. & Fonge, B. A. 2009. **Medicinal plants of Aguambu – Bamumbu in the Lebialem highlands, southwest province of Cameroon.** African Journal of Pharmacy and Pharmacology, Vol 3(1), page(s) 1-13

Nkambi, L., Skeen, R. & Ndeloh, D. 2006. **The Lebialem Highlands Montane Birds' Conservation Project, Cameroon Final Report.**

Ntasin, E.B., Ayonghe, S.N. 2008. **The geological control and triggering mechanisms of landslides of 20th July of 2003 within the Bamboutos Caldera, Cameroon.** Journal of the Cameroon Academy of Sciences, Vol 7(3), page(s) 191-204