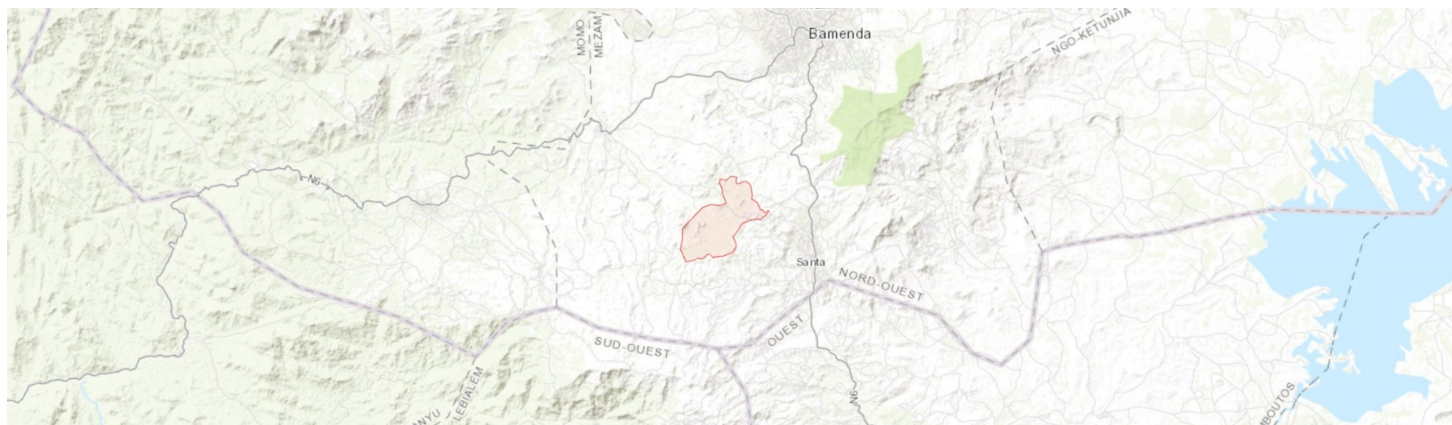


# Bali Ngemba Forest

CMNTIPA004



Country: **Cameroon**

Administrative region: **Northwest (Region)**

Central co-ordinates: **5.82434 N, 10.09582 E**

Area: **22.5km<sup>2</sup>**

## Qualifying IPA criteria

A(i)

## IPA assessment rationale

Bali Ngemba Forest Reserve qualifies as an IPA under Criterion A(i) through occurrence of around 50 threatened taxa. Several of these taxa have been collected in Cameroon only in the Bamenda highlands, and Bali Ngemba is often the only site, or one of very few, where they may survive—especially for those occurring below 2,000m. Many of these taxa have also been collected in the past in Nigeria, often from the Mambilla Plateau, although there are few recent records and those populations have likely suffered extensive habitat loss also. Because of the small size of the Bali Ngemba site compared to some much larger sites it is sometimes difficult to say that a taxon represents  $\geq 1\%$  of the global population or  $\geq 5\%$  of the national population. However, for those taxa, it is often possible to be confident that Bali Ngemba is one the five best sites nationally because there are typically less than five sites nationwide. In

addition, several taxa are strictly endemic or endemic to one or two other nearby sites as well as Bali Ngemba, for example: *Allophylus ujori* (EN), *Vepris bali* (CR), *Polystachya anthoceros* (EN), *Clutia kamerunica* (EN), *Leptonychia kamerunensis* (VU) and *Magnistipula butayei* subsp. *balingembaensis* (provisionally CR, Onana & Cheek, 2010). Several other endemic or range-restricted taxa included by Harvey et al. (2004) have not been included here as they are still to be described.

Because of the uniqueness of Bali Ngemba as a surviving remnant of submontane forest in the sub-1,900 (2,000) m zone (a vegetation type included in Letouzey's (1985) vegetation map as mapping unit 117) it could likely qualify also under IPA criterion B(i) if this habitat type were included on a national list of defined habits/vegetation types. The small area of the site means it is otherwise unlikely to qualify under criterion B although it is botanically very rich for its size.

Given the  $>95\%$  loss of forest over 1,500 m in the Bamenda Highlands reported by Harvey et al., (2004) it seems very likely that Bali Ngemba Forest Reserve site would qualify under criterion C(iii) as an instance of regional submontane forest when a suitable national list of habitats is compiled.

## Site description

Bali Ngemba Forest is a small but important patch of remaining forest in the Bamenda Highlands of Northwest Region, Cameroon.

The Bamenda Highlands, part of the Cameroon Highlands which extend north from Bioko and Mount Cameroon following a geological fault line, are an upland area of high rainfall that was previously heavily forested but has been extensively converted to grassland and savannah. It is estimated that over 95% of original forest area above 1,500 m has been lost (Cheek et al., 2000). Much of this deforestation has occurred recently.

The site is located in a valley around 15 km southwest of the city of Bamenda (3rd largest in Cameroon) and 10 km southeast from the town of Bali. It is more directly accessed from the villages of Mantum, probably the main base for small-scale logging (Harvey et al., 2004), Baba II to the northeast and Pinyin to the south, the latter likely being the base for cocoyam farming and other agriculture within the reserve. The Baba II community forest and connecting territory are included here in addition to the Bali Ngemba Forest Reserve itself. Covering an altitudinal range from 1,300–2,200m, the site contains submontane closed canopy forest (with degraded understory vegetation), heavily degraded montane forest, montane scrub and grassland, grassy inselberg areas, a Eucalyptus plantation and derived savanna and farm-fallow.

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## Botanical significance

The significance of this small, imperfectly preserved fragment of forest is mainly in relation to the deforestation that has occurred in the rest of the Bamenda highlands, formerly one of the richest plant areas in Tropical Africa. In particular, Bali Ngemba is unique in preserving primary (albeit degraded) vegetation over a continuous altitudinal range from c. 1,300 m to over 2,000 m. While larger protected areas exist in the Bamenda Highlands for montane forest above 2,000 m, Bali Ngemba represents the largest and only officially protected block of submontane forest remaining (Harvey et al., 2004).

Prior to surveys from 2000 onwards by teams associated with RBG Kew and Herbarium National du Cameroun, culminating in the 2004 Conservation Checklist (Harvey et al., 2004), Bali Ngemba was almost unknown to botanical science, having been neglected by the main collectors in the region. The bulk of pre-twenty-first century collecting, c. 50 specimens, was performed by the Nigerian Ujor in 1951 including three specimens which 50 years later have been published as new species: *Allophylus ujori* (EN), *Vepris bali* (CR) and *Deinbollia oreophila*. Two of these are globally threatened, with *Vepris bali* presumed likely extinct having not been seen since it was collected. *Deinbollia oreophila* was provisionally assessed as Vulnerable by Cheek & Etuge (2009) but new records suggest it may no longer qualify as threatened. Another feared lost species, *Newtonia cameroonensis* (CR), has been successfully rediscovered at Bali Ngemba and used for native reforestation projects (Cheek et al., 2010).

The surveys carried out between 2000 and 2004 over four expeditions led to Harvey et al., (2004) listing 12 taxa as strictly endemic to Bali Ngemba, plus another 11 near-endemic taxa and 39 threatened Red Data species. Several of these taxa were unpublished at the time and some remain so. However, c. 50 taxa

threatened taxa are listed here from the site with seven of these endemic or near endemic.

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## Habitat and geology

The following is taken from Cheek's summary in Harvey et al., (2004):

"Bali Ngemba Forest Reserve is positioned facing west in a concave part of the steep scarp slope that connects the High Lava Plateau (1,500–2,100 m alt.) of the Bamenda Highlands with the Low Lava surface (900–1,200 m alt.) on which the former appears to rest; see Fig. 1 (Hawkins & Brunt 1965). These basalts and trachytes are of ancient volcanic origin (Courade 1974). The Bamenda Highlands themselves are the most extensive of the mountainous areas, usually known as the Cameroon Highlands, that begin with the Atlantic Ocean islands of São Tomé, Príncipe, Annobon and Bioko and proceed NE, in a band 50–100 km wide. These mountains have their origin in a geological fault and are formed largely of igneous material. Three main periods of volcanic activity and one of plutonic uplift have been reviewed by Courade (1974). The Bamenda Highlands were largely formed in the Tertiary, in the second of the three main periods of volcanic activity 'the middle white series'. Courade (1974) classifies the soils in the area of Bali as being ancient, ferrallitic, and of volcanic origin, being of medium fertility (3rd class out of 4 possible classes). Tye (1986) refers to soils in the Bamenda Highlands area as being 'clayey', resulting in more permanent streams than some of the mountain areas of more recent origin in the Cameroon Highlands, such as Mt Kupe and Mwanenguba.

Courade's (1974) rainfall map shows the area in which Bali Ngemba falls being somewhere between the 1 m and 2 m isohyets. However, rainfall data for a meteorological station at Bali, only 5 km W and at the same altitude as the lower part of Bali Ngemba (1,300 m alt.) gives an annual total of c. 2.25 m (Hawkins & Brunt, 1965). Most of this falls in the single long wet season in March–October inclusive, when 20 cm or more falls in each month, only 3–9 cm falling in each of the months from Nov. to Feb. when average max. monthly temperatures are 26.7°–27 °C, the coolest months being 21.8 °C and 22.6 °C. Average minimum monthly temperatures range from 11.1 °C to 14.4 °C. Temperatures at Bali, and at Bali Ngemba are partly depressed by temperature inversion, cold air draining off the high lava plateau (Hawkins & Brunt, 1965)."

As mentioned, Bali Ngemba contains a transition from submontane forest from 1,300 m asl to montane forest, scrub and grassland up to 2,200 m (Harvey et al., 2004; Hawkins & Brunt, 1965; Letouzey 1968, 1985). The submontane forest from 1,300–1,700 m is characterised by a notable abundance of the large, deciduous canopy trees, *Pterygota mildbraedii*. Montane forest (1,900 m upwards) is rare and poorly surveyed, with forest cover lost to farming but apparently little evidence of *Sporobolus* grassland which typically succeeds degraded montane forest (Letouzey, 1985). *Podocarpus milanjanus* was collected in 1951 but has not recently been recorded since (Harvey et al., 2004). Scrub and grassland with is considered partly natural and a non-forest, "saxicole" grassland

vegetation also occurs at lower altitude on inselberg areas (Letouzey 1985, Harvey et al., 2004). There are also areas of derived scrubland, farm fallow and Eucalyptus plantation.

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## Conservation issues

Although the origins of the Bali Ngemba Forest Reserve are unclear and no official maps have been seen, it is thought to be a Production Reserve, gazetted for the commercial exploitation of timber probably some time during the British mandate period (Harvey et al., 2004). Therefore, it has only limited protection and the survival of the forest in any form is probably largely due to the steep slopes, the use of the canopy trees for growing shade crops such as cocoyams, and other value to the local community. As a forest reserve, there appears to be little tribal tradition protecting the forest as occurs elsewhere such as at Mt Kupe or Oku, nor the same community concern to protect water resources as at Dom (Harvey et al., 2004; Cheek et al., 2010). The forest is isolated and surrounded by farmland (largely *Coffea arabica*) which encroaches on all sides except the steepest sloping parts (Birdlife International, 2001). There is a large Eucalyptus plantation within the reserve and small-scale logging continues; the vegetation understorey has been largely cleared for cultivation and the canopy forest has been mostly replaced by grass and shrubland above 2,000 m (Harvey et al, 2004). The site also lies within an area approved for quarrying exploration (MINFOF & WRI, 2021).

According to Birdlife International (2001), the government forest agency (ONADEF) had recently become actively involved in the management of the reserve at that time, including creation of conservation areas and reforestation along watercourses. However, it is not known what became of these initiatives and Harvey et al. (2004) report alarming levels of forest degradation over the period of their surveys between 2000–2004. The charity ANCO have been active in the area and are currently investigating the possibility of reforesting a corridor connecting the Baba 2 forest with the nearby Santa Mbei community forest. There is reportedly good community support for such reforestation (M. Njoya, 2021, pers. comm. 23 September).

Despite repeated surveys of the small area, some species such as *Vepris bali* and *Podocarpus milanjanus* have not yet been rediscovered at the site after initially being collected and described in the early 1950s. Similarly, while Birdlife International (2001) mentioned reports of Preuss's monkey (*Cercopithecus preussi*, EN) surviving at the site, it is not known if they still occur.

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## Site assessor(s)

Bruce Murphy, Royal Botanic Gardens, Kew

Kenneth Tah, COMAID (formerly ANCO)

Martin Cheek, Royal Botanic Gardens Kew

Moses Njoya, ANCO

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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>Aeollanthus trifidus</i> Ryding	A(i), A(ii), A(iii)	✓	✓	✓	–	–	
<i>Allanblackia gabonensis</i> (Pellegr.) Bamps	A(i)	–	–	✓	–	✓	
<i>Allophylus bullatus</i> Radlk.	A(i), A(iii)	✓	–	✓	–	–	
<i>Allophylus ujori</i> Cheek	A(i)	✓	✓	✓	–	–	
<i>Begonia oxyanthera</i> Warb.	A(i)	✓	–	✓	–	✓	
<i>Bulbophyllum nigericum</i> Summerh.	A(i)	✓	–	✓	–	–	
<i>Bulbostylis densa</i> (Wall.) Hand.-Mazz. var. <i>cameroonensis</i> S.S.Hooper	A(i)	–	–	–	–	–	
<i>Chassalia laikomensis</i> Cheek	A(i), A(iii)	–	✓	–	–	–	
<i>Clusia kamerunica</i> Pax	A(i)	✓	✓	✓	–	–	
<i>Crassocephalum bauchiense</i> (Hutch.) Milne-Redh.	A(i)	–	–	✓	–	–	
<i>Crotalaria ledermannii</i> Bak.f.	A(i)	✓	✓	✓	–	–	
<i>Diaphananthe bueae</i> (Schltr.) Schltr.	A(i)	–	–	✓	–	–	
<i>Dissotis bamendae</i> Brenan & Keay	A(i)	✓	–	✓	–	✓	
<i>Dombeya ledermannii</i> Engl.	A(i)	✓	✓	✓	–	✓	
<i>Entandrophragma angolense</i> (Welw.) C.DC.	A(i)	–	–	–	–	–	
<i>Epistemma decurrens</i> H.Huber	A(i)	✓	✓	–	–	✓	
<i>Eugenia gilgii</i> Engl. & Brehme	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>Globimetula oreophila</i> (Oliv.) Tiegh.	A(i)	–	–	✓	–	–	
<i>Ixora foliosa</i> Hiern	A(i)	–	–	–	–	–	
<i>Lobelia columnaris</i> Hook.f.	A(i)	–	–	✓	–	–	
<i>Leptonychia kamerunensis</i> Engl. & K.Krause	A(i)	✓	✓	✓	–	✓	
<i>Magnistipula butayei</i> de Wild. subsp. <i>balingembaensis</i> Sothers, Prance & B.J.Pollard	A(i), A(iii)	✓	✓	✓	✓	–	
<i>Memecylon dasyanthum</i> Gilg & Ledermann ex Engl.	A(i)	–	–	✓	–	–	
<i>Newtonia camerunensis</i> Villiers	A(i)	✓	–	✓	–	–	
<i>Oncoba lophocarpa</i> Oliv.	A(i)	–	–	✓	–	–	
<i>Pavetta hookeriana</i> Hiern var. <i>hookeriana</i>	A(i)	–	–	✓	–	–	
<i>Pentarrhinum ledermannii</i> (Schlechter) Goyder & Liede	A(i)	–	–	✓	–	–	
<i>Phyllopentas ledermannii</i> (K.Krause) Kårehed & B.Bremer	A(i)	✓	–	✓	–	–	
<i>Polystachya anthoceros</i> la Croix & P.J.Cribb	A(i)	✓	✓	✓	–	–	
<i>Pseudagrostistachys africana</i> subsp. <i>africana</i>	A(i)	✓	✓	✓	–	–	
<i>Psychotria moseskemei</i> Cheek	A(i)	✓	–	✓	–	–	
<i>Quassia sanguinea</i> Cheek & Jongkind	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>Rhabdotosperma densifolia</i> (Hook.f.) Hartl	A(i)	–	–	✓	–	–	
<i>Schefflera mannii</i> (Hook.f.) Harms	A(i)	–	–	✓	–	–	
<i>Scleria afroreflexa</i> Lye	A(i)	✓	–	✓	–	–	
<i>Tricalysia elmar</i> Cheek	A(i)	✓	✓	✓	–	–	
<i>Turraeanthus africana</i> (Welw. ex C.DC.) Pellegr.	A(i)	–	–	–	–	✓	
<i>Vepris bali</i> Cheek	A(i)	✓	✓	✓	✓	–	
<i>Xylopia africana</i> (Benth.) Oliv.	A(i)	✓	–	✓	–	–	
<i>Deinbollia onanae</i> Cheek	A(i)	✓	–	✓	–	–	
<i>Wahlenbergia ramosissima</i> (Hemsl.) Thulin subsp. <i>ramosissima</i>	A(i)	✓	–	–	–	–	
<i>Bulbophyllum gravidum</i> Lindl.	A(i)	–	–	✓	–	–	
<i>Vepris onanae</i> Cheek	A(i), A(iv)	✓	✓	✓	–	–	
<i>Rhabdotosperma ledermannii</i> (Murb.) Hartl	A(i)	–	–	✓	–	–	

## 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	60	Major
Grassland - Subtropical/Tropical High Altitude Grassland	10	Minor
Artificial - Terrestrial - Subtropical/Tropical Heavily Degraded Former Forest	–	Minor
Artificial - Terrestrial - Pastureland	5	Minor

GENERAL SITE HABITAT	PERCENT COVERAGE	IMPORTANCE
Rocky Areas - Rocky Areas [e.g. inland cliffs, mountain peaks]	2	Unknown

## Land use types

LAND USE TYPE	PERCENT COVERAGE	IMPORTANCE
Nature conservation	50	Minor
Agriculture (arable)	50	Minor
Forestry	10	Minor
Harvesting of wild resources	50	Unknown

## Threats

THREAT	SEVERITY	TIMING
Agriculture & aquaculture - Annual & perennial non-timber crops - Small-holder farming	High	Ongoing - trend unknown
Biological resource use - Logging & wood harvesting	Medium	Ongoing - trend unknown

## Protected areas

PROTECTED AREA NAME	PROTECTED AREA TYPE	RELATIONSHIP WITH IPA	AREAL OVERLAP
Bali Ngemba Forest Reserve	Forest Reserve (production)	protected/conservation area matches IPA	12

## Conservation designation

DESIGNATION NAME	PROTECTED AREA	RELATIONSHIP WITH IPA	AREAL OVERLAP
Bali Ngemba Forest Reserve CMO16	Important Bird Area	IPA encompasses protected/conservation area	12

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