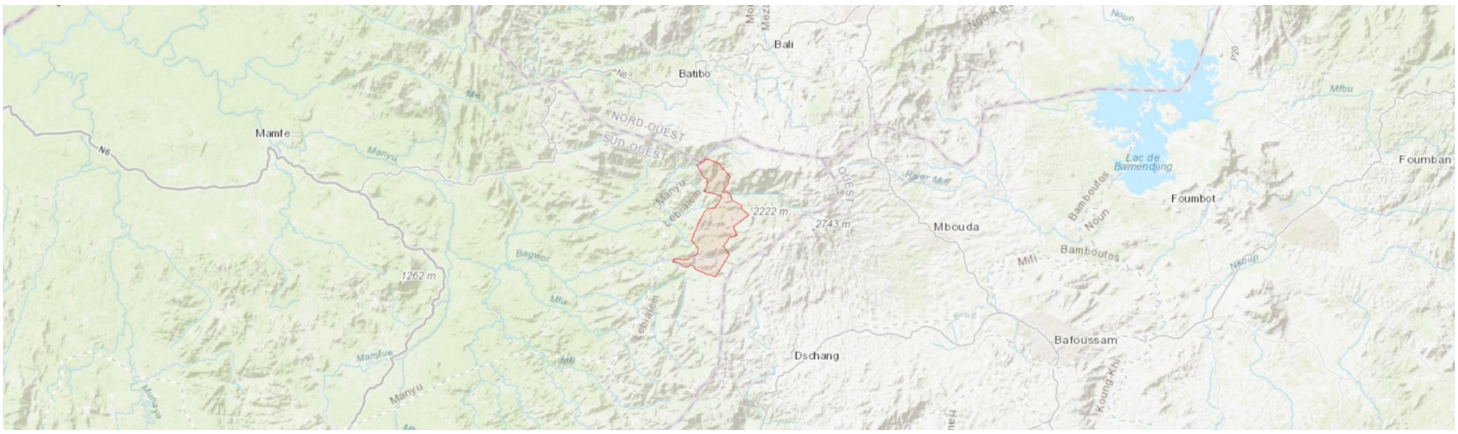
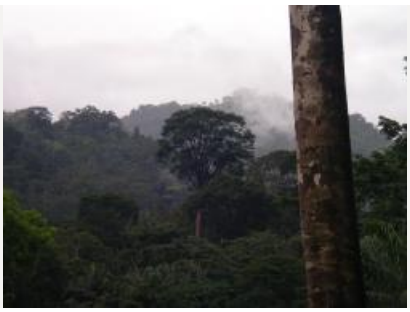
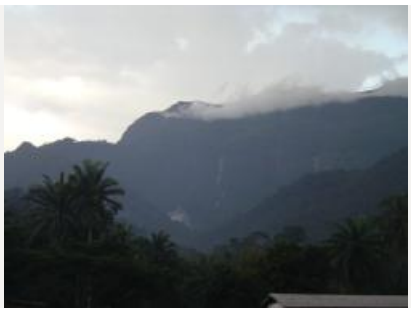
# Tofala Hill Wildlife Sanctuary, Lebialem Highlands

**CMNTIPA007**





Country: **Cameroon**
Administrative region: **Southwest (Region)**
Central co-ordinates: **1.00000 N, 10.50000 E**
Area: **15km²**

## Qualifying IPA criteria

A(i)

## IPA assessment rationale

The Tofala Hills Wildlife Sanctuary qualfies as a potential IPA under criterion A(i) through the recorded presence of 37 globally threatened species.
It is possible the site might also qualify under criterion B(i) and/or C(iii) for the vegetation type “submontane tropical forest” or a subtype, given that this habitat has suffered much loss in Cameroon. The site might also qualify under criterion B(ii) based on the number of nationally endemic or range restricted species. Twenty-two national endemics are counted here for THWS. This is equivalent to over 3.4% of the (provisional) national total of 655 (Onana, 2011) and thus exceeds the 3% threshold suggested for the IPA criterion. With regard to criterion B(iii), relatively few species are listed in Harvey et al (2010) as being of social, economic or cultural importance but this may be misleading and more ethnobotanic data is needed.

## Site description

The Lebialem Highlands, covering around 1200 km2 in northwest, west and southwest regions of Cameroon, is part of the line of volcanic uplands running from the Atlantic islands northeastwards near the Nigerian–Cameroon border area. Tofala Hill Wildlife Sanctuary, formally recognised in 2014 (Prime Ministerial Decree Number 20145212), forms a small part of these highlands, with an area of 8087 ha. It is situated in Wabane and Alou districts and has its administrative headquarters in Bechati. Although this part of Cameroon is highly populated and the site is surrounded by 10 villages and is less than 40 km from Bamenda, the third largest city in the country, it is quite remote from access routes (Harvey et al., 2010). Rapid botanical surveys by teams from Kew and the National Herbarium of Cameroon were instigated between 2004 and 2006 from Fosimondi, reached via Dschang and Baranka. A fourth survey from Bechati, reached via Dschang and Menji (Fontem), was launched in September 2006.
Although the main aim of the THWS is the conservation of primates, such as the critically endangered Cross River gorilla (Gorilla gorilla diehli), Nigeria-Cameroon chimpanzee (Pan troglodytes ellioti) and drill (Mandrillus leucophaeus), as well as other animals, the threatened and fragmented submontane forest habitat critical to the survival of these species is also of great botanical importance

(Harvey et al., 2010). While all remaining forest of the Lebialem highlands and neighbouring Bamboutos mountains is likely valuable, the THWS has been repeatedly surveyed between 2004 and 2006, culminating in the publication of a Conservation Checklist (Harvey et al., 2010). This revealed numerous threatened plant species and also some local endemics. Tofala Hill Wildlife Sanctuary was established after extensive consultations between local stakeholders, the government Ministry of Forestry and Wildlife (MINFOF) and the Environment and Rural Development Foundation (ERuDeF, a Cameroon NGO). It represents one part of a wider effort to save the remaining forest habitat in the Lebialem Highlands while enabling sustainable development for local people (Nkemngu, 2017).

## Botanical significance

There has been very little botanical collecting in the Lebialem Highlands prior to the work of ERuDeF, RBG Kew and the National Herbarium of Cameroon, particularly through Barthélemy Tchiengué, from 2003 onwards (Harvey et al., 2010). Therefore, compared to other important highland areas in the west of the country, such as Bakossi, Mount Oku and Mount Cameroon, relatively little is known to science about the flora of this area. The neighbouring Bamboutos mountains have been better studied historically but have subsequently lost much of their natural vegetation. Forest appears to be rapidly diminishing too within the Lebialem highlands (Harvey et al., 2010; Nkemengu, 2017). However, the aforementioned rapid surveys have identified over fifty species which are considered threatened by the IUCN Red List criteria, with 34 of these already published on the Red List and approximately one in ten of all species identified in Harvey et al. (2010) considered threatened. The surveys were mainly conducted along a transect through the area now demarcated as the THWS from Fosimondi village in the east at the top of the west facing scarp slope at c. 2000 m altitude, down to around 200 m at Bechati in the west. Most of the threatened species collected are from submontane forest where the steep gradients contributes to a rich diversity of species. The primary lowland forest at the western edge has been less well surveyed, as have the northern and southern parts of the site. Therefore many more species are likely yet to be found. As well as being an important sanctuary for many threatened species, the site also appears to be an interesting link in our ecological knowledge of the Cameroon Highlands, revealing apparent differences between the Bamenda Highlands to the north and the Mount Kupe area to the south. Harvey et al. (2010) listed six taxa as strictly endemic to the site. Of these Argocoffeopsis fossimondi, now Kupeantha fossimondi (CR, Harvey et al., 2010; Cheek et al., 2018; Cheek, 2017) is the only species so far published. However, several other published species are endemic to one or two other sites in the western highlands. For example Heckeldora ledermanii (EN) and Trichostachys petiolata (EN) are also known from the Kupe-Bakossi area while Cincinnobotrys letouzeyi (EN) is known only from THWS and a site near Numba 30 km to the northeast (Cheek, 2015). Although there are relatively few (published) strict endemics, there appear to be a high number of nationally endemic species known from the site. Species collected from Mt Bamboutos, such as Vepris montisbambutensis (CR) known only from the type collected between Baranka and Fossimondi on the edge of the Tofala Hill reserve may also occur here.

## Habitat and geology

The Lebialem Highlands constitute the west and south facing slope of the Bamboutos Mountains and are part of the Cameroon Highlands series of volcanic uplands which extend in a northeast direction along a geographic fault line from off-shore islands like Bioko through prominent Cameroonian peaks such as Mount Cameroon, Mount Kupe and Mount Oku. The THWS slopes steeply to the east and north with the highest point around 1900 m in the east and the lowest at c. 200 m in the southwest. In the lower part free draining sandy soils of very low fertility have formed from the ancient, decomposed basement-complex rocks which have been eroded by the topology and high annual rainfall (c. 3–4 m), much of which is concentrated in a single wet season. However, at the top of the slope, the village of Fossimondi is situated on apparently Neogene basalts and trachytes which give rise to moist volcanic soils of moderate fertility (Harvey et al. 2010; Courade et al. 1974; Hawkins and Brunt 1965). Partly for this reason and also due to severe population pressures, the uplands have been targeted for agriculture with crops such as Coffea arabica commonly grown. Cattle are also grazed on the high lava plateau. However, farming on the steep slopes has led to severe erosion in the western highlands of Cameroon (Lambi & Ndenecho et al., 2009).
The interaction of the steep scarp slope with the moist south-westerly winds of the wet season and the arid north-easterly harmattan, as well as the variable geology and erosion, likely create multiple contrasting microclimates which favour high species diversity and endemicity.

## Conservation issues

The uplands of western Cameroon have suffered severe deforestation, primarily for logging and agriculture. Farming of these highlands may have been practised for several thousand years (Vansina et al. 1984; Tamura, 1999), and therefore some disturbance of natural habitat is likely ancient. However, the pace of deforestation has hugely increased in the last century. Overall, Cheek et al. (2000) estimated that over 95% of the original montane and submontane forest above 1500 m had been lost in the nearby Bamenda highlands. This deforestation is ongoing with forest losses at Kilum-Ijum and at Dom-Kejodsam estimated as respectively 25% over 8 years and 50% over 15 year (Cheek et al., 2000; Cheek et al., 2010). The Bamboutos mountains, of which the Lebialem Highlands form the western slope, have been largely denuded of natural vegetation under severe population pressure and agricultural conversion. Increasingly even steep slopes that have hitherto survived as forest are also coming under the plough despite the difficult, often dangerous terrain and resultant soil erosion, landslides and rapid loss of fertility (Tchiengué 2010; Nkemngu

2017). While quantitative data is lacking for the Lebialem highlands, forest loss appears to be high and ongoing. At the site itself, Tchiengué (2010) reports that on subsequent annual visits areas that had been forested had been converted to farmland, including the area where the Lebialem endemic Coffeeopsis fosimondi was collected. Further dramatic losses on the slopes were observed on a visit in 2016 (B. Tchiengué, 2021, pers. comm. 7 October). All forest patches around had been converted to agricultural crops such as potatoes and carrots. Overgrazing, mining and infrastructure construction in and around the site are also reported (Nkemngu 2017). Agricultural pressure is apparently less in the lower, infertile areas of the site to the west, although here there is also logging and semi-natural palm oil harvesting (Harvey et al. 2010; Linnarz 2017). ERuDeF, supported by the Rainforest Trust USA and a member of BGCI, has been active in promoting conservation at the site and in the wider region, gaining official status for the THWS in 2014 following long consultations and sensitisation efforts. Although MINFOF have supported protection of the forest, it has been difficult to achieve this on the ground. Harvey et al (2010) report support from local villagers who were said to value the forest but not all villages have apparently been easily convinced of the merits of the sanctuary despite consultation or because of perceived failings in this process, or simply due to the lack of alternatives for sustaining livelihoods (Nkemngu 2017). Linnarz (2017) reports that the southern part of the THWS has little natural forest remaining and that the northern part is also considerably encroached. Tragically, the gorilla population for which the sanctuary was primarily established, was reported to be severely diminished with gorillas confined to a central 6.5km patch and only 2–4 gorillas estimated to be remaining from observed evidence of nesting (Linnarz 2017). Numerous signs of shooting and snaring for bushmeat were found and farming activity was found even in the most remote parts of the forest. The incident at Pinyin village in 2013 when a silverback gorilla was killed by a group of angry villagers shows that at least some local peoples remain unconvinced about the value of wildlife conservation (Nkembe & Leke, 2013). Drills and elephants have also diminished but 300 chimpanzees are still known to persist in the forest and may remain the best hope for preserving the vegetation on which they depend (Nkemngu, 2017). ERuDeF's ambitious projects to establish a Mone forest corridor and to protect the much larger Lebialem-Mone forest landscape bode well for the conservation of viable populations of threatened plants which, like the primates, risk being cut off from other populations. Local awareness of the importance of the forest in protecting against soil erosion has also helped drive local conservation action such as tree-planting. Subsequent to THWS being officially recognised, ERuDeF has been involved in consultation and drafting of a management plan, forest restoration and creation of habitat corridors linking the site to other remaining habitat. The separatist conflict which began in 2017 and has been active in the Lebialem area has interrupted conservation efforts but may also have slowed habitat loss in the forest.

## Site assessor(s)

Bruce Murphy, Royal Botanic Gardens, Kew

Louis Nkembe, ERUDEF

Martin Cheek, Royal Botanic Gardens Kew

Barthélemy Tchiengué, Institute of Agronomic Research and Development, Herbier National Camerounais, Yaoundé, Cameroon

## 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 |
|---|---|---|---|---|---|---|---|
| *Afrostyrax lepidophyllus Mildbr.* | A(i) | – | ✓ | ✓ | – | – | |
| *Allanblackia gabonensis (Pellegr.) Bamps* | A(i) | ✓ | – | – | – | – | |
| *Allophylus bullatus Radlk.* | A(i), A(iii) | ✓ | – | ✓ | – | – | |
| *Allophylus conraui Gilg ex Radlk.* | A(i) | ✓ | ✓ | ✓ | – | ✓ | |
| *Aneilema silvaticum Brenan* | A(i) | ✓ | ✓ | ✓ | – | – | |
| *Afropectinariella pungens (Schltr.) M.Simo & Stévart* | A(i) | ✓ | – | – | – | – | |
| *Anthocleista scandens Hook.f.* | A(i) | ✓ | – | ✓ | – | – | |
| *Argocoffeopsis fosimondi Tchiengué & Cheek* | A(i) | ✓ | ✓ | ✓ | ✓ | – | |
| *Baillonella toxisperma Pierre* | A(i) | – | – | – | – | ✓ | |
| *Begonia adpressa Sosef* | A(i) | ✓ | ✓ | ✓ | – | – | |
| *Begonia oxyanthera Warb.* | A(i) | ✓ | – | – | – | – | |
| *Begonia preussii Warb.* | A(i) | ✓ | – | – | – | – | |
| *Begonia pseudoviola Gilg* | A(i) | ✓ | ✓ | ✓ | – | – | |
| *Brachystephanus giganteus Champl.* | A(i) | ✓ | – | ✓ | – | – | |
| *Bulbophyllum nigericum Summerh.* | A(i) | ✓ | ✓ | ✓ | – | – | |
| *Chassalia laikomensis Cheek* | A(i), A(iii) | ✓ | – | – | – | – | |
| *Diaphananthe bueae (Schltr.) Schltr.* | A(i) | ✓ | ✓ | ✓ | – | – | |
| *Dissotis bamendae Brenan* | 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 |
|---|---|---|---|---|---|---|---|
| *& Keay* | | | | | | | |
| *Eragrostis camerunensis W.D.Clayton* | A(i) | ✓ | – | ✓ | – | – | |
| *Garcinia kola Heckel* | A(i) | – | – | – | – | ✓ | |
| *Globimetula oreophila (Oliv.) Tiegh.* | A(i) | ✓ | – | ✓ | – | – | |
| *Heckeldora ledermannii (Harms) J.J. de Wilde* | A(i) | ✓ | – | ✓ | – | – | |
| *Impatiens letouzeyi Grey-Wilson* | A(i) | ✓ | ✓ | ✓ | – | – | |
| *Leonardoxa africana (Baill.) Aubrév. subsp. letouzeyi McKey* | A(i) | ✓ | ✓ | ✓ | – | – | |
| *Leptonychia kamerunensis Engl. & K.Krause* | A(i) | ✓ | ✓ | ✓ | – | – | |
| *Lobelia columnaris Hook.f.* | A(i) | – | – | – | – | – | |
| *Magnistipula conrauana Engl.* | A(i) | ✓ | ✓ | ✓ | – | – | |
| *Myrianthus fosi Cheek* | A(i) | ✓ | ✓ | ✓ | – | – | |
| *Napoleonaea egertonii Baker f.* | A(i) | ✓ | ✓ | ✓ | – | – | |
| *Panicum acrotrichum Hook.f.* | A(i) | – | – | ✓ | – | – | |
| *Pavetta brachycalyx Hiern* | A(i) | ✓ | ✓ | ✓ | – | – | |
| *Pavetta hookeriana Hiern var. hookeriana* | A(i) | – | – | – | – | – | |
| *Polystachya bicalcarata Kraenzl.* | A(i) | ✓ | ✓ | – | – | – | |
| *Pseudagrostistachys africana subsp. africana* | A(i) | ✓ | ✓ | – | – | – | |
| *Pyrenacantha longirostrata* | 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 |
|---|---|---|---|---|---|---|---|
| *Villiers* | | | | | | | |
| *Quassia sanguinea Cheek & Jongkind* | A(i) | ✓ | ✓ | – | – | – | |
| *Rhabdotosperma densifolia (Hook.f.) Hartl* | A(i) | ✓ | ✓ | – | – | – | |
| *Sabicea xanthotricha Wernham* | A(i) | ✓ | ✓ | ✓ | – | – | |
| *Salacia lebrunii Wilczek* | A(i) | ✓ | ✓ | ✓ | – | – | |
| *Salacia lehmbachii Loes var. pes-ranulae N.Hallé* | A(i) | ✓ | ✓ | ✓ | – | – | |
| *Schefflera hierniana Harms* | A(i) | ✓ | ✓ | ✓ | – | – | |
| *Tricalysia elmar Cheek* | A(i) | ✓ | ✓ | ✓ | – | – | |
| *Trichostachys petiolata Hiern* | A(i) | ✓ | ✓ | ✓ | – | – | |
| *Xylopia africana (Benth.) Oliv.* | 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 |
|---|---|---|---|---|---|

## General site habitats

| GENERAL SITE HABITAT | PERCENT COVERAGE | IMPORTANCE |
|---|---|---|
| Forest - Subtropical/Tropical Moist Montane Forest | – | |
| Forest - Subtropical/Tropical Moist Lowland Forest | – | |
| Grassland - Subtropical/Tropical High Altitude Grassland | – | |
| Shrubland - Subtropical/Tropical High Altitude Shrubland | – | |

## Land use types

| LAND USE TYPE | PERCENT COVERAGE | IMPORTANCE |
|---|---|---|

## Threats

| THREAT | SEVERITY | TIMING |
|---|---|---|
| Energy production & mining - Mining & quarrying | Low | Past, likely to return |
| Agriculture & aquaculture - Annual & perennial non-timber crops - Shifting agriculture | 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 |
|---|---|---|---|
| Tofala Hill Wildlife Sanctuary | Wildlife Sanctuary | protected/conservation area matches IPA | 100 |

## Management type

| MANAGEMENT TYPE | DESCRIPTION | YEAR STARTED | YEAR FINISHED |
|---|---|---|---|
| Site management plan in place | Management plan was in the process of consulation... | – | – |

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