TIPA ASSESSMENT:

NIMBA MOUNTAINS, LOLA PREFECTURE

ABSTRACT

The Nimba Mountain range is an area of exceptional biodiversity globally. It has over 2,400 plant species making it the richest documented botanical site in West Africa. It has plants globally endemic to the Nimba Mountains such as Osbeckia porteresii, Sporobolus pauciflorus, Impatiens nzoana, and Begonia quadrialata subsp. nimbaensis. At least 40 threatened species, and species with restricted disjunct distributions e.g. (Justicia jamisonii) also occur. Although it is recognised as a Biosphere Reserve and World Heritage Site, the rare plant species and habitats of the range are still threatened.

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GUINEE ECOLOGIE

Plantlife

Herbier National de Guinée

DARWIN INITIATIVE

TIPA Assessment: Nimba Mountains, Lola Prefecture.

IPA criteria under which the site qualifies: A(i,iii), B(i), C(iii)

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IPA assessment rationale

The Nimba Mountain range is an area of exceptional biodiversity globally. It has over 2,400 plant species making it the richest documented botanical site in West Africa. It has plants globally endemic to the Nimba Mountains such as *Osbeckia porteresii, Sporobolus pauciflorus, Impatiens nzoana*, and *Begonia quadrialata* subsp. *nimbaensis.* At least 40 threatened species, and species with restricted disjunct distributions e.g. (*Justicia jamisonii*) also occur. Although it is recognised as a Biosphere Reserve and World Heritage Site, the rare plant species and habitats of the range are still threatened.

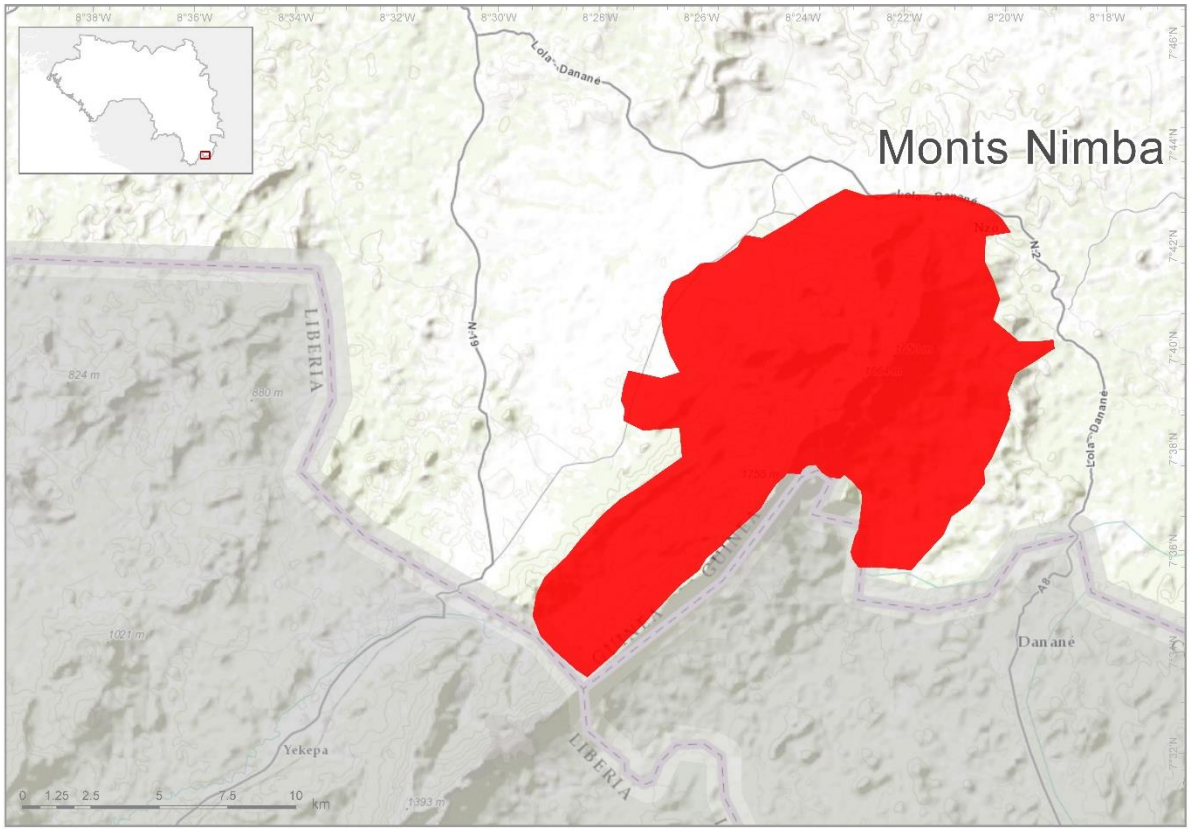
Site overview

Site Name: Nimba Mountains	
Country: Guinea	Administrative region: Lola Prefecture
Central co-ordinates: 07°37’20’’N, 08°24’36’’W	Area: 149.2 km^2
Altitude minimum: 450 m	Altitude maximum: 1752 m

Site Description

The Nimba Mountains are situated in the south-east of Guinea, in Lola Prefecture. The range extends into Liberia and Ivory Coast. The highest peak in Guinea is part of Nimba and reaches 1,752m above sea-level. The area of Nimba in Guinea covers 149.2km² and was protected in 1944. The majority (134.1km²) is recognised as a World Heritage Site and has been a core area of the Nimba Mountains Biosphere Reserve since 1980. Due to their height, age, and isolation, the Nimba Mountains are exceptionally rich in flora and fauna, with many rare and range-restricted species, including a few species endemic to the Nimba Mountains. The slopes of the mountains are forested and there is submontane grassland above this, on mainly ferralitic itabirites that have undergone various degrees of leaching of its alumina-silicate components. The high-altitude lateritic (ferralitic) bowal grasslands, and submontane forest are both recognised Threatened Habitats of Guinea.

The area is locally managed by the Centre for the Management of the Environment of the Nimba and Simandou Mountains (CEGENS).



Map showing the proposed area for protection as a TIPA. Core area in red.

Botanical significance

Due to the height and isolation of the Nimba Mountains, they are home to many rare and range-restricted species, including a few endemic to the mountain and others endemic to Guinea. Recent studies have resulted in over 2,400 plant species being recorded in the Guinean portion (pers. obs. Suter, 2018), making it the richest site in Guinea for plant species. At least 40 globally threatened species are known, though this is likely to increase as more IUCN assessments are made. The submontane forests have plants globally endemic to the Nimba Mountains, such as *Osbeckia porteresii*, *Sporobolus pauciflorus*, *Impatiens nzoana*, and *Begonia quadrialata* subsp. *nimbaensis.* The submontane grassland has threatened species found both at Nimba and in the Simandou mountains (e.g. *Kotchya lutea*, *Rhytachne glabra*, *Bulbostylis guineensis*, and *Nemum bulbostyloides*). There are also species found here that have disjunct distributions across Africa (e.g. *Justicia jamisonii* and *Marsdenia exellii*). Some species named 'nimba', while first collected at Nimba, have subsequently been found on other parts of the Guinean highlands (e.g. *Ixora nimbana*, *Brachystephanus jaundensis* subsp. *nimbae*, *Dolichos nimbaensis*, and *Monanthotaxis nimbana*).

General habitat and geology description

The Nimba Mountains represent a rift area of the early Proterozoic era, similar in age and structure to the Simandou range intrusion. The range comprises itabirite, quartzite and other schists emplaced onto a terrain of tonalitic granite-gneiss, migmatite, and sedimentary gneisses. There is a significant iron ore deposit which is in the forms of haematites and goethites enriched from long-term leaching and weathering processes, including thrusting, faulting, folding and thermal processes.

Conservation issues

The mountains are threatened by:

- Intense poaching, suffering from the 'empty-forest' syndrome.
- Agricultural encroachment, which has disturbed far more habitat, generally at low altitudes in forest, than any other form of disturbance.
- Regular, anthropogenic, and intense bushfires are a problem at the height of the dry season, when they do not occur naturally.
- Invasive species. In particular, *Chromolaena odorata*, which has invaded mid-altitude savannahs and forest-edges.
- Grazing of cattle at low elevations at the edge of forest.
- Isolation from neighbouring intact ecosystems due to agriculture, forestry, and roads in the surrounding lowlands.
- Mineral exploration in the mining enclave.

An area of 15.16km² was excised from the colonial Strict Nature Reserve of 1944 for mineral exploration, covering 10% of the Guinean Nimba Mountains, and 4.8% of the entire Nimba range. Within this enclave, an iron-ore mining concession of 6.25km² is currently in late-phase exploration. Mineral exploration has resulted in the construction of access roads and drill pads, affecting up to 0.5km². If a mine were developed, it would result in the disturbance of a several square kilometres of the enclave. For this reason, a detailed environmental impact assessment is underway to avoid and minimise negative impacts, particularly to the adjacent World Heritage Site, and to seek how best to close a future mine and rehabilitate the site for its long-term, subsequent conservation. Since the same habitat types are found within the mining enclave and the World Heritage site, this TIPA area will acknowledge the mining zone as an area of development, with the objective of minimising disturbance to the area as a whole.

Concerns have also been raised by the World Heritage Committee about a road upgrade running between Lola (Guinea) and Danané (Ivory Coast), in the Biosphere Reserve's Buffer Zone. The World Heritage Committee has retained Nimba on the list of World Heritage Sites in Danger (2018).

Despite controls in place to manage these threats, continuing damage to the World Heritage Site is possible and will inevitably reduce the global populations of some species, and the extent of Threatened Habitats.

Protected area status and Management

Strict Nature Reserve (1944, updated in 2010), Managed Nature Reserve (2010), Biosphere Reserve (1980, updated in 1993), World Heritage Site (1980, updated in 1993). The TIPA surrounds the Strict Nature Reserve and the Managed Natural Reserve, part of the Biosphere Reserve and the World Heritage Site.

Threats

Agriculture:	Villagers in the foothills of the Nimba area have encroached with their fields, burning the mountains and isolating it from surrounding natural habitats.
Wildfires:	Anthropogenic bushfires regularly burn the mountain most years at a time when they do not occur naturally
Invasive species:	Invasive exotic species like *Chromolaena odorata* are rapidly colonising certain ecosystems, in particular savannahs and forest-edge between 450-1200m altitudes.
Mining:	An iron ore concession in the northern portion the mountain range, outside of the current Strict Nature Reserve, may be developed.

Habitat isolation: Nimba Mountains are increasingly isolated from neighbouring natural habitat
Hunting: Illegal hunting, leading to wildfires (see above) and reduced regeneration of certain species and habitats.
Grazing: Cattle are grazed in the lowland savannah, disturbing lowland savannah types, forest edges, and burning forest to create more savannah

Threat level: High

Criterion A: Threatened Species

			Site contains…					
Criterion A taxon present	IPA subcriterion	IUCN redlist assessment	**≥ 1% of global population**	**≥ 5% of national population**	**Is 1 of 5 best sites nationally**	Entire global population (single-site endemic)	Species is of socio-economic importance	*Abundance at site
Begonia quadrialata subsp. nimbaensis Sosef	A(i)	EN	⊙	⊙	⊙	⊙		Common
Tarenna hutchinsonii Bremek.	A(i)	CR	⊙	⊙				Scarce
Justicia jamisonii Jongkind & Vollesen	A(i)	EN	⊙	⊙				Infrequent
Marsdenia exellii C. Norman	A(i)	EN	⊙	⊙	⊙			Scarce
Bulbostylis guineensis Cherm. ex Bodard	A(i)	EN	⊙	⊙	⊙			Unknown
Hypolytrum cacuminum Nelmes	A(i)	EN	⊙	⊙	⊙			Common
Okoubaka aubrevillei Pellegr. & Normand	A(i)	EN	⊙	⊙	⊙			Frequent
Allophylus samoritourei Cheek	A(i)	EN	⊙	⊙	⊙			Infrequent
Brachystephanus jaundensis subsp. nimbae Lindau	A(i)	VU	⊙	⊙	⊙			Infrequent
Terminalia ivorensis A. Chev.	A(i)	VU	⊙				⊙	Frequent
Nemum bulbostyloides (Hooper) J. Raynal	A(i)	VU	⊙	⊙				Common

Albizia ferruginea (Guill. & Perr.) Benth.	A(i)	VU	⊙	⊙			⊙	Frequent
Kotschya lutea (Portères) Hepper	A(i)	VU	⊙	⊙				Common
Gladiolus praecostatus Marais	A(i)	VU	⊙	⊙				Common
Genlisea barthlottii Porembski, Eb. Fisch. & Gemmel	A(i)	VU	⊙	⊙				Common
Dorstenia astyanactis Aké Assi	A(i)	VU	⊙	⊙	⊙			Scarce
Panicum glaucocladum C.E. Hubb.	A(i)	VU	⊙	⊙				Common
Rhytachne glabra (Gledhill) Clayton	A(i)	VU	⊙	⊙	⊙			Common
Homalium smythei Hutch. & Dalziel	A(i)	VU	⊙	⊙	⊙			Frequent
Pavetta platycalyx Bremek.	A(i)	VU?	⊙	⊙	⊙			Frequent
Copaifera salikounda Heckel	A(i)	VU	⊙	⊙	⊙			Frequent
Cryptosepalum tetraphyllum (Hook. f.) Benth.	A(i)	VU	⊙	⊙	⊙			Common
Cola reticulata A. Chev.	A(i)	VU	⊙	⊙	⊙			Frequent
Entandrophragma angolense (Welw. ex C. DC.) C. DC.	A(i)	VU	⊙		⊙		⊙	Frequent
Entandrophragma candollei Harms	A(i)	VU	⊙		⊙		⊙	Frequent
Khaya grandifoliola C. DC.	A(i)	VU	⊙		⊙		⊙	Frequent
Milicia regia (A. Chev.) C.C. Berg	A(i)	VU	⊙		⊙		⊙	Frequent
Polystachya orophila Stévart & E. Bidault	A(i)	EN	⊙	⊙	⊙			Common
Vernonia nimbaensis C.D.Adams	A(i)	EN	⊙	⊙	⊙			Unknown

Glenniea adami (Fouilloy) Leenh.	A(i)	VU	⊙	⊙	⊙			Unknown
Rinorea djalonensis A.Chev.	A(i)	VU	⊙	⊙	⊙			Unknown
Pavetta leonensis Keay	A(i)	EN	⊙	⊙	⊙			Unknown
Tarenna brachysiphon (Hiern) Keay	A(i)	EN	⊙	⊙				Unknown
Cola angustifolia K. Schum.	A(i)	EN	⊙	⊙	⊙			Unknown
Osbeckia porteresii Jacq.-Fél.(Jacq.-Fél.)	A(i)	EN	⊙	⊙	⊙	⊙		Unknown
Heterotis sylvestris (Jacq.-Fél.) Jacq.-Fél.(	A(i)	EN	⊙	⊙	⊙			Unknown
Droogmansia chevalieri (Harms) Hutch. & Dalziel	A(i)	EN	⊙	⊙	⊙			Unknown
Dracaena calocephala Bos	A(i)	VU	⊙					Unknown
Sporobolus pauciflorus A.*Chev.*	A(i)	CR(PE)	⊙	⊙	⊙	⊙		Unknown
Impatiens nzoana A.Chev.	A(i,iii)	EN	⊙	⊙	⊙	⊙		Unknown

Key: IUCN category: CR Critically Endangered, EN Endangered, VU Vulnerable. Abundance: Abundant, Common, Frequent, Infrequent, Scarce, Unknown

Criterion B: Botanical Richness

B(i) exceptional botanical richness within a defined habitat			B(ii): exceptional number of species of conservation importance - site recording table (from nationally agreed list)		B(iii): exceptional number of useful / culturally valuable species (from nationally agreed list)	
*Habitat code and name	**Site is part of the top 10% of the national resource**	**Site is one of the 5 best sites nationally for that habitat**	**Site contains ≥ 3% of the species on the national list**	**Site is one of the 15 richest locations nationally**	**Site contains ≥ 3% of the species on the national list**	**Site is one of the 15 richest locations nationally**
Submontane Grassland	⊙	⊙	○	○	○	○
Submontane Forest	⊙	⊙				

*Criterion B taxon present	Sub-criterion under which species qualifies	For B(i) – indicator of habitat	*Abundance at site
Justicia guineensis (Heine) W. D. Hawth. & Jongkind	B(i)	Submontane Forest	Frequent
Brachystephanus jaundensis subsp. *nimbae* Lindau	B(i)	Submontane Forest	Infrequent
Bulbophyllum scariosum Summerh.	B(i)	Submontane forest	Scarce
Cassipourea adamii Jacq.-Fél.	B(i)	Submontane forest	Infrequent
Croton aubrevillei J.Léonard	B(i)	Submontane forest	Scarce
Helichrysum globosum Sch. Bip. ex A. Rich.	B(i)	Submontane Forest	Unknown
Impatiens nzoana A.Chev. !!!	B(i)	Submontane Forest	Scarce
Monanthotaxis nimbana (Schnell) Verdc.	B(i)	Submontane Forest	Unknown
Brachycorythis paucifolia Summerh.	B(i)	Submontane grassland	Infrequent
Bulbostylis guineensis Cherm. ex Bodard	B(i)	Submontane grassland	Infrequent
Coleus lateriticola (A. Chev.) Phillipson, O. Hooper & A.J. Paton	B(i)	Submontane grassland	Infrequent
Dolichos nimbaensis Schnell	B(i)	Submontane grassland	Frequent
Dolichos tonkouiensis Portères	B(i)	Submontane grassland	Frequent
Droogmansia scaettaiana A. Chev. & Sillans	B(i)	Submontane grassland	Common
Eriosema laurentii De Wild.	B(i)	Submontane grassland	Frequent

Eriosema parviflorum subsp. *collinum* Hepper	B(i)	Submontane grassland	Unknown
Eriosema spicatum subsp. *collinum* Hook. f.	B(i)	Submontane grassland	Unknown
Genlisea barthlottii Porembski, Eb. Fisch. & Gemmel	B(i)	Submontane grassland	Frequent
Gladiolus praecostatus Marais	B(i)	Submontane grassland	Frequent
Gynura micheliana J., G.Adam	B(i)	Submontane grassland	Scarce
Kotschya lutea (Portères) Hepper	B(i)	Submontane grassland	Frequent
Nemum bulbostyloides (Hooper) J. Raynal	B(i)	Submontane grassland	Abundant
Panicum glaucocladum C.E. Hubb.	B(i)	Submontane grassland	Frequent
Polygala cristata P.Taylor	B(i)	Submontane grassland	Infrequent
Rhytachne glabra (Gledhill) Clayton	B(i)	Submontane grassland	Infrequent
Rhytachne megastachya Jacq.-Fél.	B(i)	Submontane grassland	Unknown
Scleria robinsoniana J. Raynal	B(i)	Submontane grassland	Infrequent
Vernonia nimbaensis C.D. Adams	B(i)	Submontane grassland	Frequent
Virectaria multiflora (Sm.) Bremek.	B(i)	Submontane grassland	Frequent
Osbeckia porteresii Jacq.-Fél.	B(i)	Submontane grassland (on rocks)	Unknown
Phyllanthus jaegeri Jean F.Brunel & J.P.Roux	B(i)	Submontane grassland (on rocks)	Unknown
Polystachya dalzielii Summerh.	B(i)	Submontane grassland (on rocks)	Scarce
Polystachya orophila Stévart & E. Bidault	B(i)	Submontane grassland (on rocks)	Infrequent

Key: Abundance: Abundant, Common, Frequent, Infrequent, Scarce, Unknown.

Criterion C: Threatened Habitat

			Site contains…		
*Habitat type	IPA subcriterion	IUCN redlist assessment	**≥ 5% of national resource (for C(i) and C(ii))**	**≥ 10% of national resource (for C(iii))**	Estimated area at site (if known)
High-altitude grasslands with high species diversity	C(iii)		○	⊙	
Submontane forest	C(iii)			⊙	

Lowland evergreen forest	C(iii)			⊙	

Bibliography

UNESCO: https://whc.unesco.org/en/list/155

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Birdlife International: http://datazone.birdlife.org/site/factsheet/monts-nimba-(part-of-mount-nimba-transboundary-aze)-iba-guinea/text

IUCN Red List: www.redlist.org

Couch, C; Magassouba, S; Rokni, S; Cheek, M. (2018) Threatened plants species of Guinea-Conakry: A preliminary checklist. PeerJ Preprints. https://doi.org/10.7287/peerj.preprints.3451v1

Site in pictures

View of the Nimba Mountains. Photo ©Denise Molmou