



## TIPA ASSESSEMENT: SOUTHERN SIMANDOU MOUNTAINS, BEYLA AND MACENTA PREFECTURES

### ABSTRACT

The southern Simandou mountains have the second highest diversity of plant species in Guinea after the Nimba Mts, with over 1400 documented plant species and c. 40 threatened species including one species globally endemic to Pic de Fon. Mining and the associated infrastructure will have a significant impact on the vegetation of the area when it goes ahead.

Charlotte Couch, Martin Cheek and Xander van der Burgt

# TIPA Assessment: Southern Simandou Mountains, Beyla and Macenta Prefectures.

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

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## IPA assessment rationale

The southern Simandou Mountains have the second highest diversity of plant species in Guinea after the Nimba Mountains, with over 1,400 documented plant species and c. 40 threatened species, including one species globally endemic to Pic de Fon. Although the Pic de Fon Classified Forest has a management plan, there have been some oversights in the plan impacting on the plant species. A lack of on-the-ground protection and management has led to increased artisanal diamond mining in the submontane and lowland forest at Banko, the largest area of previously intact forest in the area. Mining and the associated infrastructure will have a significant impact on the vegetation of the area when it goes ahead.

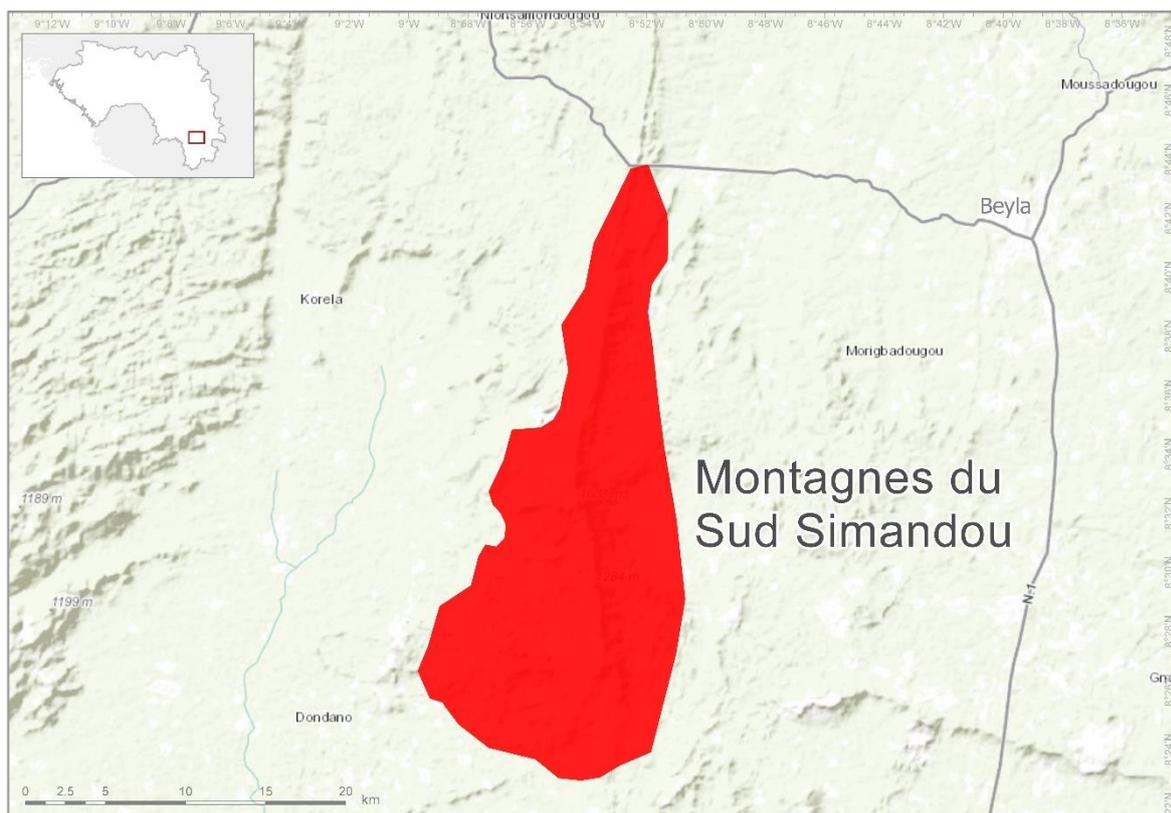
## Site overview

Site Name: Southern Simandou mountains	
Country: Republic of Guinea	Administrative region: Macenta Prefecture
Central co-ordinates: 08°32'N, 08°55'W	Area: 368 km <sup>2</sup>
Altitude minimum: 550 m	Altitude maximum: 1658 m

## Site Description

The southern Simandou range of mountains is situated in the south-east of Guinea. It straddles the prefectures of Macenta and Beyla and is part of the Loma-Man range that extends into Sierra Leone. The highest peak, Pic de Fon, reaches 1,658m. It has species associations with the Guinea Highlands (Fouta Djallon) and with the Nimba Mountains. The ridges and flanks have a mosaic of submontane forest and submontane lateritic (ferralitic) bowal (grassland) with high species diversity, both of which are recognised as Threatened Habitats of Guinea.

The area has extensive iron ore deposits and a mining concession has been granted by the government to Rio Tinto. A Social and Environmental Impact Assessment (SEIA) was carried out between 2005 and 2011 and was submitted to government in 2012. A management plan was agreed by the government in 2010, 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

The Simandou range is of a similar age to the Nimba Mountains and has many shared species in both the submontane forest and submontane ferrallitic bowal. Recent studies in the southern Simandou Mountains have documented more than 1,400 plant species including c. 40 threatened species, ranging from Critically Endangered (CR) to Vulnerable (VU), many of which will be impacted by the mining concession. The transition zone between the submontane forest and ferrallitic bowal grassland has many rare and endangered plant species, such as *Lipotriche tithonioides* and *Acalypha guineensis*. The submontane grassland has a high species diversity with many endangered species (e.g. *Xysmalobium samoritourei*, *Dissotis (Anaheterotis) pobeguinii*, *Rhytachne glabra*, and *Kotschyia lutea*). It also hosts the one and only globally endemic species to Pic de Fon, *Eriosema triformum*. There is also some high-altitude bowal with temporary seepage or swamp areas with *Kotschyia micrantha*, *Nemum bulbostyloides*, and *Utricularia* spp. Some species historically also found in the Fouta Djallon and Simandou (e.g. *Keetia futa* and *Habenaria jaegeri*) are no longer present in the Fouta Djallon and therefore the Simandou mountains are the last refuge for these species in Guinea.

## General habitat and geology description

The Simandou Mountains represent a rift area of the early Proterozoic era, similar in age and structure to the Nimba 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 along the ridge top which is in the forms of haematites and goethites enriched from long-term leaching and weathering processes.

## Conservation issues

There are several current threats to the southern Simandou Mountains. See below for further details.

The mine will occupy a total area of approximately 6,400 hectares (ha), including safety and security zones around the works. Within this area, a total of approximately 3,750ha will be occupied by the mine pits, waste emplacements, other developed areas, roads, and conveyors. The remaining area will not be cleared of vegetation but will be under the management of the Mine Operations team and will not be available for social or commercial use by the public (Simandou SEIA. Volume I. Mine. 2012).

A detailed SEIA was carried out between 2005 and 2011 to support a plan to minimise the impact of mining on all aspects of the environment. In the report, vegetation types are given a value based on specific criteria relating to distribution and diversity. Submontane lateritic (ferrallitic) bowal (grassland), submontane forest, submontane forest-grassland (ferrallitic bowal), transition areas, and high-altitude bowal with swamps are all labelled as high-value habitats. It has been previously proposed by Simfer/Rio Tinto that the forest on the western side and the area at Dabatini peak would be left as conservation areas. However, the current mine footprint will remove half of the known population of the Critically Endangered and globally unique *Eriosema triformum*. The status of the mine is currently unknown, but there has been reduction in activity since 2015.

There is a management plan in place which implicates community-led conservation organisations, Centre Forestière de Nzérékoré, and CEGENS, with support from Simfer/Rio Tinto. The total area under management is 16,887ha (66.9% of the total forested area). There is a core Protected Area with restricted access of 8,839ha (35% of the total area of the Classified Forest). There is also a 'production zone' of 8,048ha (31.9 % of the total area of the Classified Forest). (Pic de Fon Management Plan. 2010).Lack of on-the-ground protection from the managing authorities has led to increased forest destruction within the Classified Forest from artisanal diamond mining, visible via Google Earth imagery.

The TIPA will take into account that there is a mining concession within the proposed area, but that the mining company should work to minimise damage to the identified high-value vegetation types.

## Protected area status and Management

Pic de Fon Classified Forest was designated in 1953. The current management plan (Plan d'Aménagement et Plan de Gestion de la Forêt Classée du Pic de Fon) runs from 2010 to 2030, with reviews every 5 years.

## Threats

Agricultural expansion:	Increase in size of villages due to the presence of the mining project
Artisanal diamond mining:	This is affecting the lowland/submontane forest to the west of the range near Banko,
Prevention of fires:	Lack of fires in the mining concession hinders the reproduction of certain threatened pyrophytic species,
Animal disturbance:	Cattle grazing and trampling in previously undisturbed areas due to a change in the management plan
Mineral exploitation and infrastructure placement :	Roads and drill pads have disturbed the submontane grassland and areas have been cleared destroying some threatened species,

Invasive species: There has also been an increase in invasive species in the area as a result of increased traffic because of mining preparations.

Annual anthropogenic grassland fires: Fires invade forest edges and decrease the area of submontane forest.

**Threat level: High**

## Criterion A: Threatened Species

Criterion A taxon present	IPA subcriterion	IUCN redlist assessment	Site contains...			Entire global population (single-site endemic)	Species is of socio-economic importance	*Abundance at site
			≥ 1% of global population	≥ 5% of national population	Is 1 of 5 best sites nationally			
<i>Lipotriche tithonioides</i> (Aké Assi) D.J.N.Hind	A(i)	EN	☉	☉	☉			Locally common
<i>Habenaria jaegeri</i> Summerh.	A(i)	EN	☉	☉	☉			Locally common
<i>Acalypha guineensis</i> J.K. Morton & G.A.Lavin	A(i)	VU	☉	☉	☉			Scarce
<i>Eriosema triforum</i> Burgt	A(i)	EN	☉	☉	☉	☉		Locally common
<i>Kotschyia lutea</i> (Portères) Hepper	A(i)	VU	☉	☉	☉			Frequent
<i>Garcinia afzelii</i> Engl.	A(i)	VU					☉	Infrequent
<i>Xysmalobium samoritourei</i> Goyder	A(i)	EN	☉	☉	☉			Infrequent
<i>Psychotria samoritourei</i> Cheek	A(i)	VU	☉	☉	☉			Infrequent
<i>Pavetta lasioclada</i> (K.Krause) Mildbr. Ex. Bremek	A(i)	VU	☉					Infrequent
<i>Polystachya orophila</i> Stévant & E.Bidault	A(i)	EN	☉	☉	☉			Scarce
<i>Rhytachne glabra</i> (Gledhill) Clayton	A(i)	VU	☉	☉	☉			Frequent
<i>Eriosema spicatum</i> subsp. <i>collinum</i> Hook.f.	A(i)	VU	☉	☉	☉			Frequent
<i>Fleroya stipulosa</i> (DC.) Y.F.Deng	A(i)	VU					☉	Unknown

<i>Dorstenia astyanactis</i> Aké Assi	A(i)	VU	⊙	⊙	⊙			Infrequent
<i>Anubias gracilis</i> A.Chev. ex Hutch.	A(i)	VU	⊙	⊙	⊙			Scarce
<i>Amorphophallus abyssinicus</i> subsp. <i>akeassii</i> N.E. Br.	A(i)	VU?	⊙	⊙	⊙			Scarce
<i>Kotschya micrantha</i> Harms	A(i)	VU	⊙	⊙	⊙			Locally common
<i>Nemum bulbostyloides</i> (Hooper) J. Raynal	A(i)	VU	⊙	⊙	⊙			Frequent
<i>Milicia regia</i> A.Chev.	A(i)	VU					⊙	Infrequent
<i>Cryptosepalum tetraphyllum</i> (Hook.f.) Benth.	A(i)	VU	⊙		⊙			Frequent
<i>Anaheterotis (Dissotis) pobeguinii</i> (Hutch. & Dalziel) Ver.-Lib. & G.Kadereit	A(i)	VU	⊙	⊙	⊙			Infrequent
<i>Mikaniopsis tedliei</i> (Oliv. & Hiern) C.D.Adams	A(i)	VU?	⊙	⊙	⊙			Scarce
<i>Guarea cedrata</i> (A.Chev.) Pellegr.	A(i)	VU					⊙	Infrequent
<i>Isoglossa dispersa</i> I.Darbysh. & L.J.Pearce	A(i)	VU	⊙	⊙	⊙			Very locally common
<i>Brachystephanus oreacanthus</i> Champ.	A(i)	VU	⊙	⊙	⊙			Very locally common
<i>Utricularia macrocheilos</i> (P.Taylor) P.Taylor	A(i)	VU	⊙	⊙				Infrequent
<i>Entandrophragma angolense</i> (Welw.) C.DC.	A(i)	VU					⊙	Infrequent
<i>Keetia futa</i> Cheek	A(i)	EN	⊙	⊙	⊙			Scarce
<i>Entandrophragma candollei</i> Harms	A(i)	VU					⊙	Infrequent
<i>Cola angustifolia</i> K.Schum.	A(i)	EN	⊙	⊙				Infrequent
<i>Drypetes afzelii</i> (Pax) Hutch.	A(i)	VU	⊙					Frequent
<i>Garcinia kola</i> Heckel	A(i)	VU					⊙	Infrequent
<i>Copaifera salikounda</i> Heckel	A(i)	VU					⊙	Infrequent

<i>Afzelia africana</i> Sm.	A(i)	VU					⊙	Frequent
<i>Khaya grandifoliola</i> C. DC.	A(i)	VU					⊙	Infrequent
<i>Pavetta platycalyx</i> Bremek.	A(i)	VU ?	⊙					Infrequent
<i>Nauclea diderrichii</i> (De Wild. & T.Durand) Merrill	A(i)	VU					⊙	Frequent
<i>Lophira alata</i> Banks ex Gaertn.f.	A(i)	VU					⊙	Infrequent
<i>Anopyxis klaineana</i> (Pierre) Engl.	A(i)	VU					⊙	Infrequent
<i>Gladiolus praecostatus</i> Marais	A(i)	VU	⊙	⊙	⊙			Locally common

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
High altitude ironstone bowal	⊙	⊙	○	○	○	○
Submontane forest	⊙	⊙				

*Criterion B taxon present	Sub-criterion under which species qualifies	For B(i) – indicator of	*Abundance at site
<i>Habenaria jaegeri</i> Summerh.	B(i)	High altitude ironstone bowal	Locally common in two places
<i>Xysmalobium samoritourei</i> Goyder	B(i)	High altitude ironstone bowal	Infrequent
<i>Eriosema triformum</i> Burgt	B(i)	High altitude ironstone bowal	Locally common
<i>Polystachya orophila</i> Stévant & E.Bidault	B(i)	High altitude ironstone bowal	Scarce
<i>Panicum ecklonii</i> Nees	B(i)	High altitude ironstone bowal	Scarce
<i>Elionurus muticus</i> (Sprengel) Kuntze	B(i)	High altitude ironstone bowal	Frequent

<i>Rhytachne glabra</i> (Gledhill) Clayton	B(i)	High altitude ironstone bowl	Frequent
<i>Eriosema spicatum</i> subsp. <i>collinum</i> Hook. f.	B(i)	High altitude ironstone bowl	Frequent
<i>Lactuca praevia</i> C.D.Adams	B(i)	High altitude ironstone bowl	Frequent
<i>Stomatanthes africanus</i> (Oliv. & Hiern) H.Rob. & R.M.King	B(i)	High altitude ironstone bowl	Frequent
<i>Vernonia acrocephala</i> Klatt	B(i)	High altitude ironstone bowl	Frequent
<i>Aeschynomene pulchella</i> Planch. ex Benth.	B(i)	High altitude ironstone bowl	Infrequent
<i>Protea madiensis</i> Oliv.	B(i)	High altitude ironstone bowl	Frequent
<i>Amorphophallus abyssinicus</i> subsp. <i>akeassii</i> N.E. Br.	B(i)	High altitude ironstone bowl	Infrequent
<i>Crotalaria glauca</i> Willd.	B(i)	High altitude ironstone bowl	Unknown
<i>Aloe buettneri</i> A.Berger	B(i)	High altitude ironstone bowl	Scarce
<i>Vernonia purpurea</i> Sch.Bip.	B(i)	High altitude ironstone bowl	Infrequent
<i>Pseudarthria hookeri</i> var. <i>hookeri</i> Wight & Arn.	B(i)	High altitude ironstone bowl	Infrequent
<i>Raphionacme brownii</i> Scott-Elliot	B(i)	High altitude ironstone bowl	Scarce
<i>Dissotis pobeguinii</i> Hutch & Dalz.	B(i)	High altitude ironstone bowl	Scarce
<i>Habenaria zambesina</i> Rchb.f.	B(i)	High altitude ironstone bowl	Locally common
<i>Kotschya lutea</i> (Portères) Hepper	B(i)	High altitude ironstone bowl	Frequent
<i>Nemum bulbostyloides</i> (Hooper) J. Raynal	B(i)	High altitude ironstone bowl	Frequent
<i>Bulbostylis pusilla</i> subsp. <i>congolensis</i> (A.Rich.) C.B.Cl.	B(i)	High altitude ironstone bowl	Unknown
<i>Cyperus tenuiculmis</i> Boeck.	B(i)	High altitude ironstone bowl	Frequent
<i>Fimbristylis dichotoma</i> (L.) Vahl	B(i)	High altitude ironstone bowl	Frequent
<i>Loudetia kagerensis</i> (K.Schum.) C. E. Hubb. ex Hutch.	B(i)	High altitude ironstone bowl	Frequent
<i>Teramnus buettneri</i> (Harms) Baker.f	B(i)	High altitude ironstone bowl	Unknown
<i>Cyperus cyperoides</i> (L.) Kuntze	B(i)	High altitude ironstone bowl	Frequent
<i>Lipocarpha chinensis</i> (Osbeck) J.Kern	B(i)	High altitude ironstone bowl	Frequent
<i>Ascolepis brasiliensis</i> (Kunth) Benth. ex C.B.Clarke	B(i)	High altitude ironstone bowl	Infrequent
<i>Xyris decipiens</i> N.E.Br.	B(i)	High altitude ironstone bowl	Unknown
<i>Kotschya micrantha</i> Harms	B(i)	High altitude ironstone bowl	Locally common
<i>Liparis nervosa</i> (Thunb.) Lindl.	B(i)	High altitude ironstone bowl	Unknown
<i>Platycoryne paludosa</i> Rolfe	B(i)	High altitude ironstone bowl	Frequent
<i>Habenaria papyracea</i> Schltr.	B(i)	High altitude ironstone bowl	Unknown

<i>Gladiolus praecostatus</i> Marais	B(i)	Submontane grassland	Locally common
<i>Belonophora coffeoides</i> subsp. <i>hypoglauca</i> Hook.f.	B(i)	Submontane forest	Frequent
<i>Brillantaisia owariensis</i> P.Beauv.	B(i)	Submontane forest	Frequent
<i>Chassalia kolly</i> (Schumach.) Hepper	B(i)	Submontane forest	Frequent
<i>Cryptosepalum tetraphyllum</i> (Hook.f.) Benth.	B(i)	Submontane forest	Common
<i>Cyathea manniana</i> Hook.	B(i)	Submontane forest	Infrequent
<i>Dracaena arborea</i> Link	B(i)	Submontane forest	Infrequent
<i>Drypetes principum</i> (Müll.Arg.) Hutch.	B(i)	Submontane forest	Infrequent
<i>Eugenia leonensis</i> Engl. & Brehmer	B(i)	Submontane forest	Infrequent
<i>Garcinia smeathmannii</i> (Planch. & Triana) Oliv.	B(i)	Submontane forest	Infrequent
<i>Hypoestes triflora</i> (Forssk.) Roem. & Schult.	B(i)	Submontane forest	Frequent
<i>Morus mesozygia</i> Stapf	B(i)	Submontane forest	Frequent
<i>Nuxia congesta</i> R.Br. ex Fresen.	B(i)	Submontane forest	Infrequent
<i>Parinari excelsa</i> Sabine	B(i)	Submontane forest	Common
<i>Peperomia fernandopoiana</i> C.DC.	B(i)	Submontane forest	Frequent
<i>Pouteria altissima</i> (A.Chev.) Baehni	B(i)	Submontane forest	Infrequent
<i>Samanea leptophylla</i> (Harms) Brenan & Brummitt	B(i)	Submontane forest	Infrequent
<i>Santiria trimera</i> (Oliv.) Aubrév.	B(i)	Submontane forest	Frequent
<i>Synsepalum cerasiferum</i> (Welw.) T.D.Penn.	B(i)	Submontane forest	Infrequent
<i>Syzygium staudtii</i> (Engl.) Mildbr.	B(i)	Submontane forest	Infrequent
<i>Trichilia djalonis</i> A.Chev.	B(i)	Submontane forest	Infrequent
<i>Uapaca chevalieri</i> Beille	B(i)	Submontane forest	Infrequent
<i>Zanthoxylum rubescens</i> Hook.f.	B(i)	Submontane forest	Infrequent

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

## Criterion C: Threatened Habitat

*Habitat type	IPA subcriterion	IUCN redlist assessment	Site contains...		Estimated area at site (if known)
			≥ 5% of national resource (for C(i) and C(ii))	≥ 10% of national resource (for C(iii))	
Submontane forest	C(iii)			⊙	
Lowland forest	C(iii)			⊙	
High altitude ferrallitic bowal grassland	C(iii)			⊙	

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## Site in pictures



View towards Dabatini Peak. Photo: Xander van der Burgt. 2008 ©RBG Kew



Submontane forest eastern side. Photo: Xander van der Burgt. 2008 ©RBG Kew



Submontane grassland on high altitude ferrallitic bowal. Photo: Xander van der Burgt. 2008 ©RBG Kew



Effects of mining activities on the Southern Simandou Mountains. Photo: Xander van der Burgt. 2008 ©RBG Kew



*Acalypha guineensis* J.K. Morton & G.A.Lavin  
 (Photo: © Xander van der Burgt, RBG Kew)



*Eriosema triformum* Burgt  
 (Photo: © Xander van der Burgt, RBG Kew)



*Anaheterotis (Dissotis) pobeguinii* (Hutch. & Dalziel) Ver.-Lib. & G.Kadereit (Photo: © Xander van der Burgt, RBG Kew)



*Nemum bulbostyloides* (Hooper) J. Raynal  
 (Photo: © Xander van der Burgt, RBG Kew)