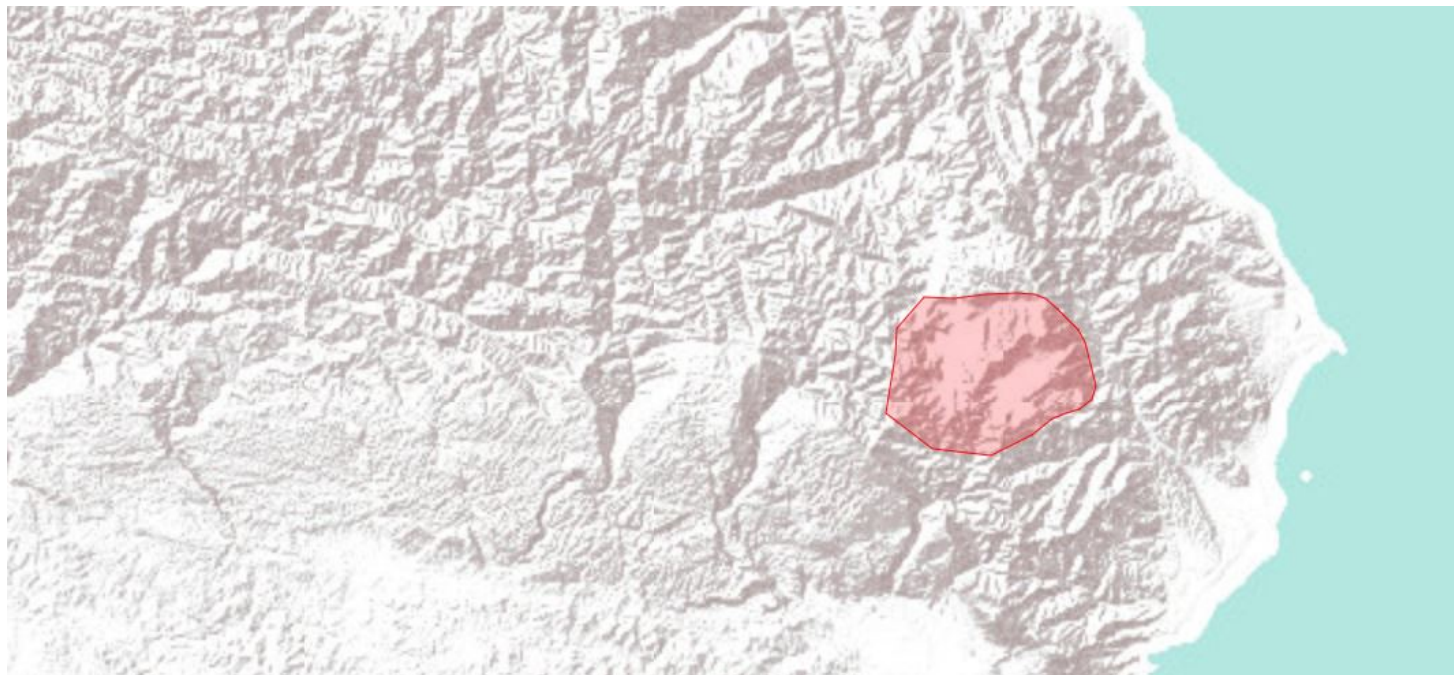


Anggi Lakes

Danau Anggi (Test version)

NGUTIPA002



Country: New Guinea
 Administrative region: Papua (Province)
 Central co-ordinates: -1.37684 N, 133.92578 E
 Area: 67.4km²



Qualifying IPA criteria

A(i), A(iii)

IPA assessment rationale

The Anggi Lakes has over 60 endemic plant species found nowhere else in New Guinea. The site contains the known global population of all of these species, which qualifies the site as a TIPA under Criterion A(iii). Some of these endemic species have completed global Red List assessments, of which 6 are Critically Endangered, 6 are Endangered, 5 are Vulnerable. The presence of these globally threatened species qualifies the Anggi Lakes under Criterion A(i). The botanical richness of the Anggi Lakes as compared to the rest of New Guinea has not been explored, but Vollering et al. (2017) defined it as a separate biogeographical region for orchids. Indonesian New Guinea is very poorly collected, so the high number of endemic and threatened species at the Anggi Lakes may be an artefact of it being comparatively well botanically surveyed. The socially, economically and culturally valuable plant species have not

yet been surveyed at this site.

Site description

The Anggi Lakes is a pair of large freshwater montane lakes in the north-west of New Guinea, in Indonesian West Papua province. Each lake is about 8km long. The site is about 50km south of Manokwari and 35km inland from the coast with the Arfak mountains to the north. The elevation is between 1880–2400 metres asl. This hotspot of plant diversity within the Bird's Head region is also one of the best collected sites (Cámara-Leret et al. 2020). However, it was found to be a separate phytogeographical region for orchids (Vollering et al. 2017). The Anggi Lakes themselves are an important freshwater habitat, and are inhabited by people from Arfak, Hatam, and Sougb language groups who use the majority of the lowlands close to the lakes for subsistence agriculture. The area is impacted by repeated burning for subsistence agriculture, the construction of roads and an increasing human population as a result of the creation of the new Pegunungan Arfak Regency.



Botanical significance

The site is of high botanical importance as there are at least 60 vascular plant species which are so far only known from the Anggi Lakes. Of these endemic species which have been assessed so far

(19 in total), 13 are considered threatened species: 5 Vulnerable, 6 Endangered, 6 Critically Endangered, with a further 6 assessed as Data Deficient. Among the habitats of particular conservation importance present at the Anggi Lakes are: Lower montane forest, Ericaceae-dominated montane shrubbery with *Rhododendron*, and mossy high elevation shrubbery with *Hydnophytum*.

Habitat and geology

The Anggi Lakes lies within the Vogelkop montane forests ecoregion and has a tropical moist montane climate. The elevation ranges from about 1880 metres asl at the lake surface to the highest peak Mount Gwamongga in the south-west which is c.2600 metres asl.

The two lakes have differing hydrology and are separated by a mountainous ridge. Anggi Giji has darker water and brown sandy soils, deriving from low-grade metamorphic rocks including shale. Anggi Gida has lighter water and white sandy soils, deriving from high grade metamorphic rocks (quartzite) and granite to the south-east of the lake. The largest river in the area enters Anggi Giji at Irai. The habitats present in the Anggi Lakes are are: Seasonally fluctuating lake edge: grassland, reedbeds; Lower montane forest; Swamp with Poaceae and Cyperaceae; *Dodonea* secondary shrubbery; Ericaceous-dominated shrubbery; Mixed montane shrubbery; Regularly burnt areas dominated by *Pteridium aquilinum*, *Baekea frutescens* and Poaceae.

The lowlands surrounding the lakes have mostly been cleared for agriculture and settlements. Both lakes are surrounded by roads which have expanded and improved since 2019, making the area more accessible to vehicles. Anggi Giji has a denser human population, and therefore more settlements and roads. The town of Irai is expanding as the capital of the new Pegunungan Arfak Regency. Anggi Gida has a lower human population and therefore more intact habitat.

Conservation issues

The main threats to the habitats in the area are fires linked to agricultural activities and habitat conversion for settlements and new roads. The forest loss around Anggi Giji and the ridge between the two lakes is visible on recent satellite imagery. There forest loss around both lakes that have been ongoing since 2001 according to Global Forest Watch data, but this is higher around the more populated Anggi Giji. Some of these bare slopes may have been deforested before the satellite era, and fires were recorded by some of the early 20th century botanical expeditions. The area is vulnerable to the regional-level threats of climate-change-linked increasing instances of fire and drought. In normal years fires lit in grassland seldom penetrate further than forest edges, but in drought periods fires can be extensive (Hope 2014). Repeatedly burnt areas Anggi is within the ranges of two threatened mammals, the Arfak Ringtail possum (VU) and Ursine Tree Kangaroo (VU) but it is unknown if they occur in the area. The lakes are important for wetland birds, and there are several endemic to northwest New Guinea with a range including the Anggi Lakes: Grey-banded

mannikin, Arfak Honeyeater, Arfak *Astrapia*. A lizard endemic to Anggi (*Lobulia vogelkopensis*, a single specimen known) was described by Slavenko et al. in 2022. Insects are very undersurveyed and there is likely to be a very high diversity e.g. 8 new Lycanidae (beetles) species and 1 new genus as yet unpublished found in recent surveys.

Site assessor(s)

Laura Jennings, Royal Botanic Garden Kew

Liam Trethowan, Royal Botanic Gardens, Kew

Wendy Mustaqim, Universitas Samudra, Aceh

Tim Utteridge, Royal Botanic Gardens, Kew

Charlie D. Heatubun, The Provincial Government of West Papua and Universitas Papua

Jimmy Wanma, State University of Papua

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>Alsophila arfakensis</i> A.Gepp	A(iii)	✓	✓	–	✓	–	Unknown
<i>Alsophila indiscriminata</i> Lehnert	A(iii)	✓	✓	–	✓	–	Unknown
<i>Gaultheria berberidifolia</i> Sleumer	A(iii)	✓	✓	–	✓	–	Unknown
<i>Rhododendron laetum</i> J.J.Sm.	A(iii)	✓	✓	–	✓	–	Frequent
<i>Vaccinium dictyoneuron</i> Sleumer	A(i)	✓	✓	–	✓	–	Unknown
<i>Vaccinium gjellerupii</i> J.J.Sm.	A(i), A(iii)	✓	✓	–	✓	–	Unknown
<i>Vaccinium ligustrifolium</i> J.J.Sm.	A(i)	✓	✓	–	✓	–	Unknown
<i>Vaccinium roseiflorum</i> J.J.Sm.	A(i)	✓	✓	–	✓	–	Unknown
<i>Vaccinium tubiflorum</i> J.J.Sm.	A(i), A(iii)	✓	✓	–	✓	–	Unknown
<i>Polyosma trimeniifolia</i> Kaneh. & Hatus.	A(i)	✓	✓	–	✓	–	Unknown
<i>Agalmyla angiensis</i> (Kaneh. & Hatus.) Hilliard & B.L.Burt	A(iii)	✓	✓	–	✓	–	Unknown
<i>Agalmyla hirta</i> Hilliard & B.L.Burt	A(iii)	✓	✓	–	✓	–	Unknown
<i>Cryptocarya sericeo-triplinervia</i> Kosterm.	A(i)	✓	✓	–	✓	–	Unknown
<i>Endiandra albiramea</i> Kosterm.	A(i)	✓	✓	–	✓	–	Unknown
<i>Medinilla ferruginescens</i> Ohwi	A(i)	✓	✓	–	✓	–	Unknown
<i>Poikilogyne mucronato-serrulata</i> Ohwi	A(iii)	✓	✓	–	✓	–	Unknown

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>Xanthomyrtus grandiflora</i> A.J.Scott	A(i)	✓	✓	–	✓	–	Unknown
<i>Xanthomyrtus oreophila</i> A.J.Scott	A(i)	✓	✓	–	✓	–	Unknown
<i>Aglossorrhyncha fruticicola</i> J.J.Sm.	A(iii)	✓	✓	–	✓	–	Unknown
<i>Bulbophyllum adolinae</i> Schuit., Wanma, Mambor & Heatubun	A(iii)	✓	✓	–	✓	–	Unknown
<i>Bulbophyllum triclavigerum</i> J.J.Sm.	A(iii)	✓	✓	–	✓	–	Unknown
<i>Cerastostylis angiensis</i> J.J.Sm.	A(iii)	✓	✓	–	✓	–	Unknown
<i>Crepidium grandiflorum</i> (J.J.Sm.) Szlach.	A(iii)	✓	✓	–	✓	–	Unknown
<i>Crepidium productum</i> (J.J.Sm.) Szlach.	A(iii)	✓	✓	–	✓	–	Unknown
<i>Cryptostylis arfakensis</i> J.J.Sm.	A(iii)	✓	✓	–	✓	–	Unknown
<i>Dendrobium glaucoviride</i> J.J.Sm.	A(iii)	✓	✓	–	✓	–	Unknown
<i>Dendrobium infractum</i> J.J.Sm.	A(iii)	✓	✓	–	✓	–	Unknown
<i>Dendrobium papuanum</i> J.J.Sm.	A(iii)	✓	✓	–	✓	–	Unknown
<i>Dendrobium riparium</i> J.J.Sm.	A(iii)	✓	✓	–	✓	–	Unknown
<i>Glomera angiensis</i> J.J.Sm.	A(iii)	✓	✓	–	✓	–	Unknown
<i>Glomera similis</i> J.J.Sm.	A(iii)	✓	✓	–	✓	–	Unknown
<i>Goodyera gibbsiae</i> J.J.Sm.	A(iii)	✓	✓	–	✓	–	Unknown
<i>Liparis gibbsiae</i> J.J.Sm.	A(iii)	✓	✓	–	✓	–	Unknown
<i>Liparis lacus</i> J.J.Sm.	A(iii)	✓	✓	–	✓	–	Unknown
<i>Mediocalcar</i>	A(i)	✓	✓	–	✓	–	Unknown

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>bulbophylloides</i> J.J.Sm.							
<i>Octarrhena cylindrica</i> J.J.Sm.	A(iii)	✓	✓	–	✓	–	Unknown
<i>Phreatia densissima</i> J.J.Sm.	A(iii)	✓	✓	–	✓	–	Unknown
<i>Platanthera klossii</i> (Ridl.) Efimov	A(iii)	✓	✓	–	✓	–	Unknown
<i>Stigmatodactylus gibbsiae</i> (Kores) P.Kores	A(iii)	✓	✓	–	✓	–	Unknown
<i>Phyllanthus poli-borealis</i> Airy Shaw	A(iii)	✓	✓	–	✓	–	Unknown
<i>Pittosporum anggiense</i> D.M.Hicks & Utteridge	A(iii)	✓	✓	–	✓	–	Unknown
<i>Embelia arfakensis</i> Kaneh. & Hatus.	A(iii)	✓	✓	–	✓	–	Unknown
<i>Maesa fruticosa</i> Gibbs	A(iii)	✓	✓	–	✓	–	Unknown
<i>Myrsine arfakensis</i> (Kaneh. & Hatus.) Pipoly	A(iii)	✓	✓	–	✓	–	Unknown
<i>Helicia fragilis</i> Foreman	A(iii)	✓	✓	–	✓	–	Unknown
<i>Hydnophytum caminiferum</i> Wistuba, U.Zimm., Gronem. & Marwinski	A(iii)	✓	✓	–	✓	–	Unknown
<i>Acronychia glauca</i> T.G.Hartley	A(iii)	✓	✓	–	✓	–	Unknown
<i>Pleioluma lanatifolia</i> (P.Royen) Swenson	A(iii)	✓	✓	–	✓	–	Unknown
<i>Solanum gibbsiae</i> J.R.Drumm.	A(iii)	✓	✓	–	✓	–	Unknown
<i>Riedelia exalata</i> Valeton	A(iii)	✓	✓	–	✓	–	Unknown
<i>Heptapleurum arfakense</i> (Gibbs) Lowry & G.M.Plunkett	A(iii)	✓	✓	–	✓	–	Unknown

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>Dendromyza dendromyzoides</i> (Stauffer) Byng & Christenh.	A(i), A(iii)	✓	✓	–	✓	–	Unknown
<i>Acronychia arfakensis</i> Gibbs	A(i), A(iii)	✓	✓	–	✓	–	Unknown
<i>Kibara oligocarpella</i> (Kaneh. & Hatus.) Philipson	A(i), A(iii)	✓	✓	–	✓	–	Unknown
<i>Vaccinium angiense</i> Kaneh. & Hatus.	A(iii)	✓	✓	–	✓	–	Unknown
<i>Neolitsea arfakensis</i> Kaneh. & Hatus.	A(i), A(iii)	✓	✓	–	✓	–	Unknown
<i>Helicia celata</i> Foreman	A(iii)	✓	✓	–	✓	–	Unknown
<i>Plesioneuron angiense</i> Holttum	A(iii)	✓	✓	–	✓	–	Unknown
<i>Rhododendron bullifolium</i> Sleumer	A(iii)	✓	✓	–	✓	–	Unknown
<i>Rhododendron asperrimum</i> Sleumer	A(iii)	✓	✓	–	✓	–	Unknown
<i>Saurauia angica</i> Kaneh. & Hatus.	A(iii)	✓	✓	–	✓	–	Unknown
<i>Heptapleurum angiense</i> (Gibbs) Lowry & G.M.Plunkett	A(i)	✓	✓	–	✓	–	Unknown
<i>Rhododendron bullifolium</i> Sleumer	A(iii)	✓	✓	–	✓	–	Unknown
<i>Dimorphanthera thibaudifolia</i> Sleumer	A(iii)	✓	✓	–	✓	–	Unknown
<i>Trochocarpa arfakensis</i> (Kaneh. & Hatus.) Sleumer	A(iii)	✓	✓	–	✓	–	Unknown
<i>Trigonotis ciliolata</i> I.M.Johnst.	A(iii)	✓	✓	–	✓	–	Unknown
<i>Astronidium subvaginatum</i> Ohwi	A(iii)	✓	✓	–	✓	–	Unknown
<i>Freycinetia pseudopetiolata</i>	A(iii)	✓	✓	–	✓	–	Unknown

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>A.P.Keim, Kuswata & W.Sujarwo</i>							
<i>Freycinetia wiharjae</i> A.P.Keim, Witono & W.Sujarwo	A(iii)	✓	✓	—	✓	—	Unknown

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	—	Major
Shrubland - Subtropical/Tropical High Altitude Shrubland	—	Major

Land use types

LAND USE TYPE	PERCENT COVERAGE	IMPORTANCE
Agriculture (arable)	—	Minor
No use	—	Major
Residential / urban development	—	Minor

Threats

THREAT	SEVERITY	TIMING
Residential & commercial development - Housing & urban areas	Medium	Ongoing - increasing
Natural system modifications - Fire & fire suppression - Increase in fire frequency/intensity	Medium	Ongoing - increasing
Climate change & severe weather - Droughts	Unknown	Future - inferred threat
Agriculture & aquaculture - Annual & perennial non-timber crops - Shifting agriculture	Medium	Ongoing - trend unknown

Management type

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

Bibliography

World Resources Institute 2023. **Global Forest Watch 2023.**

Hope, G. 2014. **The Sensitivity of the High Mountain Ecosystems of New Guinea to Climatic Change and Anthropogenic Impact.** Arctic, Antarctic, and Alpine Research, Vol 46, page(s) 777–786

Giesen, W. 1994. **Indonesia's major freshwater lakes: A review of current knowledge, development processes and threats.** Internationale Vereinigung für Theoretische und Angewandte Limnologie: Mitteilungen, Vol 24, page(s) 115-128

Vollering, J., Schuiteman, A., de Vogel, E., van Vugt. R., and Raes, N. 2015. **Phytogeography of New Guinean orchids: patterns of species richness and turnover.** Journal of Biogeography, Vol 43, page(s) 204–214

Atmawinata, S, Hakim, A.S., and Pieters, P.E. 1989. **Peta Geologi Lembar Ransiki (1: 250,000) SA 53-6.**

Slavenko, A., Tamar, K., Tallowin, O.J., Kraus, F., Allison, A., Carranza, S. and Meiri, S. 2022. **Revision of the montane New Guinean skink genus Lobulia (Squamata: Scincidae), with the description of four new genera and nine new species..** Zoological Journal of the Linnean Society, Vol 195, page(s) 220-278