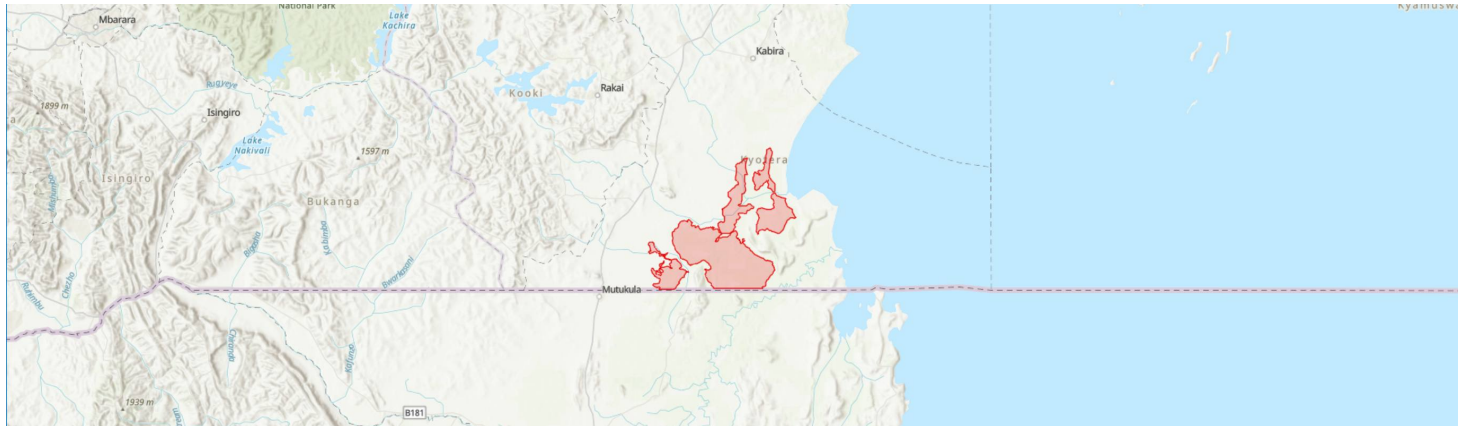


Sango Bay

UGATIPA3



Country: **Uganda**

Administrative region: **Central (Region)**

Central co-ordinates: **-0.93149 N, 31.60277 E**

Area: **191.23km²**

Qualifying IPA criteria

A(i), B(iii), C(i)

IPA assessment rationale

Sango Bay qualifies as an IPA under criterion A(i) with a total nine trigger taxa, one Critically Endangered, one Endangered and four Vulnerable taxa (including a taxonomically revised and reassessed *Dicranolepis pyramidalis*) meeting A(i) thresholds. Additional threatened species are known from Minziro Forest Reserve, which adjoins this IPA across the Tanzanian border, and it is highly likely that some of these species occur within this IPA and might also trigger sub-criterion A(i). Sango Bay also hosts exceptional richness in useful plant species and therefore triggers sub-criterion B(iii). Finally, Sango Bay hosts the majority of *Baikiaea-Podocarpus* swamp forest, a globally restricted and threatened ecosystem, and so also triggers sub-criterion C(i).

Site description

Sango Bay is a grouping of five separate Central Forest Reserves (CFR) in Rakai District of Uganda's Central Region. These forest reserves include Malabigambo and Kaiso Forest Reserves, which meet the Uganda-Tanzania border at their southern extent, Namalala, nearest to Sango Bay town, and Tero East and Tero West Forest Reserves situated at the northernmost extent of this grouping.

Falling within the Kagera River floodplain, this site is dominated by swamp forests and inundated grasslands (Luke et al. in prep.). The swamp forests of Malabigambo and Kaiso form a continuous habitat corridor with Minziro Forest Reserve in Tanzania.

While the entirety of Sango Bay IPA falls within protected areas, much of the forest at these sites is secondary as it has been heavily logged in the past and continues to face threats from small-scale wood harvesting (Howard 1991; NELSAP-CU 2021). However, these forests are of significant conservation importance as together they encompass all of Uganda's *Baikiaea-Podocarpus* Seasonal Swamp Forest and together represent the most extensive swamp forest known nationally (Langdale-Brown et al. 1964).

Botanical significance

Sango Bay is of great botanical significance as one of the few, and most extensive, examples of swamp forest in Uganda. The site is highly biodiverse, possibly because the forests were Pleistocene refugia while forests elsewhere receded due to arid climatic conditions (Bakamwesiga et al. 2000). A checklist of the plants of the Sango Bay CFRs, and neighbouring Minziro Forest Reserve, compiled by Luke et al. (2024), includes 576 different taxa recorded from Sango Bay (including taxa that have not been identified or described).

Several taxa recorded from this site are known to be globally threatened with extinction, for instance, Sango Bay is the only site globally from which the Critically Endangered variety *Vangueria volkensii* var. *fyffei* is known. This variety is known only from its type collection, made in Malabigambo CFR in 1913, and is threatened by habitat loss and disturbance within this forest (Gereau et al. 2017). Further research is therefore needed to confirm the continued presence of *V. volkensii* var. *fyffei* at this site.

One Endangered species, *Rytigynia acuminatissima* subsp. *acuminatissima* is known from this site. Although this species is also known from D.R. Congo, Rwanda, Burundi, Tanzania and Kenya, a number of sites throughout this species' range are threatened by habitat loss with some local extirpations recorded (Ntore et al. in prep.). In addition, three Vulnerable species are known from this site: *Psilotrichium majus*, *Grewia rugosifolia* and *Dasylepis eggelingii*. The lattermost is near-endemic to Uganda, with the majority of this species' range falling within Uganda's borders and only three localities known from D. R. Congo (Kalema et al. 2021).

Two additional Vulnerable species, *Khaya anthotheca* and *Prunus africana*, are known from the Sango Bay Forest Reserves. Both of these species are socio-economically important: both species are harvested for their timber while *P. africana* is also used for its medicinal properties. Although both have been assessed as Vulnerable, they do not trigger sub-criterion A(i) at this site as they are widespread across Tropical Africa and nationally.

Although not an IPA trigger species, *Afrocarpus dawei* is of note as it is globally assessed as Near Threatened and is known only northern Tanzania, eastern D. R. Congo and Uganda (Farjon 2013). This species was previously co-dominant within this IPA, but only immature individuals remain due to extensive harvesting in the past (Luke et al. 2024).

Some additional range-restricted and threatened plant species are known from neighbouring Minziro forest, which is contiguous with Malabigambo and Kaiso CFRs of Sango Bay, but have not yet been recorded from this IPA. Close to double the total number of plant taxa known from Sango Bay have been recorded in neighbouring Minziro including some species of conservation importance (Luke et al. 2024). For instance, the range restricted species *Oldenlandia lancifolia* var. *seseensis*, which is only known from Minziro and Bugala and Bussi Islands in Lake Victoria, is also likely to occur within Sango Bay (Gereau et al. 2019). In addition, there are eight threatened species known from Minziro that have not yet been recorded from Sango Bay including the Endangered species *Albertisia exelliana*, *Blotiella trichosora* and *Psychotria bagshawei* (Luke et al. 2024). Further survey work in the forests of Sango Bay would likely reveal the presence of some of these species currently only known from the Tanzanian side of this forest.

A significant ethnobotanical study of the useful plant species was undertaken by Ssegawa & Kasenene (2007). They reported the presence of 168 plant species, the majority of which are already listed on the useful plant checklist, triggering criterion B(iii). The grassland habitats found within Sango Bay forest reserve were found to have the highest number of useful plant species. In particular, high levels of medicinal plants were recorded, like *Anisopappus africanus*, which at the time was the first record of use for this plant species in Uganda, being used to cure headaches. This also highlights the vast and important store of traditional ecological knowledge of the people who are local to the area, underscoring the importance of ensuring that habitats such as this are accessible,

and plants are harvested sustainably (See 'Conservation Issues'). Ethnobotanical vouchers for this study can be found at MHU.

Habitat and geology

Sango Bay IPA is a wetland landscape, dominated by swamp forests alongside some permanently flooded papyrus swamp and seasonally inundated grasslands (NELSAP-CU 2020). The area is underlain by granite and gneiss basement rocks, overlain by sandstones, with clay-peat soils throughout most of the IPA (Langdale-Brown et al. 1964; Elshehawi et al. 2019; NELSAP-CU 2020). The site experiences a bi-modal rainy season, from September to November and March to May with average precipitation ranging from 800 to 2,000 mm and daily temperatures averaging around 28°C (NELSAP-CU 2020).

Much of the IPA is covered by seasonally flooded swamp forest, which Howard (1991) found to be an outlier of the Guineo-Congolian forests in terms of species composition. Langdale-Brown et al. (1964) categorise these forests as *Baikiaea-Podocarpus* swamp dominated by *Baikiaea insignis*, a species typical of Guineo-Congolian forest, and *Podocarpus latifolius* (LC). Both of these species are valued for their timber (IUCN 2022) and, as a result of previously widespread logging at this site, the majority of stands are now secondary forest. *Afrocarpus dawei* (formerly *Podocarpus usambarensis* var. *dawei*) was also co-dominant at this site, however, logging for its timber has greatly decreased the population size at this site (NELSAP-CU 2020) and globally this species is now assessed as Near Threatened on the IUCN Red List (Farjon 2013). In 2023, we observed there to be few *Podocarpus* or *Afrocarpus* trees and, although *B. insignis* was still prevalent, we saw almost no recruitment of any of these species at the site. We found *Chrysophyllum* (s.l.) and *Shirakiopsis* to be common in the canopy, while *Trichilia* sp. dominated the mid-storey and *Argomuellera macrophylla* the understorey. In wetter areas of swamp forest, observed to be particularly prevalent in Namalala, Macaranga and *Alchornea* dominated with dense areas of *Marantachloa purpurea* in the understorey. The swamp forests within this IPA are important for several threatened taxa including *Vangueria volkensii* var. *fyffei* (CR) and *Rytigynia acuminatissima* (EN).

At the edges of some of the CFRs, observed at Malabigambo and Tero, excessive flooding in 2022 had led to waterlogging and tree death, giving way to dense, marshy vegetation (Kasiita, pers. comm. 2023). We also observed *Eucalyptus* plantations at the edges of Tero and Namalala CFRs.

There is some papyrus swamp within this IPA, dominated by *Cyperus papyrus*, which is mostly confined to parts of Tero West and Namalala (Langdale-Brown et al. 1964). Areas of seasonally inundated grassland include co-dominant species such as *Hyparrhenia diplandra*, *H. rufa*, *Imperata cylindrica*, *Setaria sphacelata* and *Sorghastrum stipoides* (Luke et al. 2024).

Conservation issues

Sango Bay IPA consists of five different Central Forest Reserves, Malabigambo, Kaiso, Namalala, Tero East and Tero West, each established in 1932 (World Resources Institute 2022). The Malabigambo and Kaiso CFRs are of particular importance as they form a continuous forest patch with Minziro across the border in Tanzania. This large area of forest is of great importance for supporting viable and resilient populations of species that would otherwise not survive in more fragmented habitat (Howards 1991). However, there has been a long history of logging within this IPA, particularly of dominant *Podocarpus* and *Afrocarpus* species which were harvested for timber, such that much of these forest stands are now secondary regeneration.

The Sango Bay forests are still used by local communities today, particularly as a source of fuelwood but also for harvesting materials, medicines, food and for grazing livestock (Bakamwesiga et al. 2000). The impact of most of these activities on the habitats of this IPA is yet to be extensively quantified, although we observed charcoal burning at several locations in and around the reserves, with clear evidence of harvesting of timber for this purpose. Additionally, some useful species, such as *Warburgia ugandensis* and *Mitragyna rubrostipulata*, both of which are used as treatment for malaria, have been described by local residents as threatened, citing unsustainable harvesting practices and techniques (Ssewaga & Kasenene 2007). There is also some encroachment into wetland habitats by farmers when land becomes degraded elsewhere (NELSAP-CU 2020). In addition, Sango Bay Estates Limited, one of the largest sugar manufacturers in Uganda, had plantations covering around 65,000 hectares northwest of this site, although this land is now in the process of being repossessed for oil palm cultivation (The Independent 2023; Luke et al. 2024). On the Ssesse Islands, such plantations have led to forest degradation by decreasing available land for farming and timber extraction, therefore creating greater pressure on natural forests (Namaganda 2018). There are great concerns that establishment of palm oil plantations will have also have a negative impact on the forest reserves of Sango Bay.

However, the Nile Equatorial Lakes Subsidiary Action Program (NELSAP) has been working in the area to better understand the threats and conservation needs of both Sango Bay and Minziro, compiling a Conservation Investment Plan to help promote and direct conservation funding for the area. In addition, as part of the the 2003 National Forestry and Tree Planting Act, several Collaborative Forest Management (CFM) groups have been established around CFRs within Sango Bay. The aim of these groups is to “improve forest conservation and livelihoods of forest adjacent communities” and they have attracted support from both NGOs and research initiatives (Kazoora et al. 2019). However, a number of CFM agreements have not been formalised and large areas of land allocated to tree planting are being used for food crops. Despite some limitations, there have also been successes, for example, the Kigazi CFM was able to raise their concerns of illegal encroachment in Malabigambo CFR with the President of Uganda (Kazoora et al.

2019).

The wider Sango Bay area, was assessed in 2012 as an Important Bird Area, based on the presence of significant populations of biome-restricted bird species, as well as some threatened bird species such as Grey Parrot (*Psittacus erithacus*, EN) and Blue Swallow (*Hirundo atrocaerulea*, VU) (Birdlife International 2022). The presence of Blue Swallow also triggers a Key Biodiversity Area (Plumptre 2019). The Sango Bay-Musambwa Island-Kagera Wetland System (SAMUKA) RAMSAR site has been designated due to the unique wetland habitats. SAMUKA meets several RAMSAR criteria including unique wetland habitat that represents a regional transition between central and eastern Africa, the presence of large waterbird colonies and records of numerous threatened taxa (Byaruhanga & Kigoolo 2005). All three of these conservation designations cover a larger area than the proposed IPA, including the wetland habitats between the CFRs of this IPA.

Site assessor(s)

Sophie Richards, Royal Botanic Gardens, Kew
Iain Darbyshire, Royal Botanic Gardens, Kew
Florence O'Sullivan, Royal Botanic Gardens, Kew
Samuel Ojelel, Makerere University Herbarium
James Kalema, Makerere University Herbarium

Date of first assessment:

3rd Mar 2024

Reviewed by:

Isaac Kiyingi, National Forestry Resources Research Institute (NaFoRRI)

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>Psilotrichum majus</i> Peter	A(i)	✓	✓	—	—	—	Unknown
<i>Grewia rugosifolia</i> De Wild.	A(i)	✓	✓	✓	—	✓	Unknown
<i>Khaya anthotheca</i> (Welw.) C.DC.	A(i)	—	—	—	—	✓	Occasional
<i>Prunus africana</i> (Hook.f.) Kalkman	A(i)	—	—	—	—	✓	Occasional
<i>Rytigynia acuminatissima</i> (K.Schum.) Robyns subsp. <i>acuminatissima</i>	A(i)	—	✓	✓	—	✓	Unknown
<i>Vangueria volkensii</i> K.Schum. var. <i>fyffei</i> (Robyns) Verdc.	A(i)	✓	✓	✓	✓	—	Scarce
<i>Dasylepis eggelingii</i> J.B.Gillett	A(i)	✓	—	—	—	—	Unknown
<i>Dicranolepis pyramidalis</i> Gilg	A(i)	✓	✓	—	—	—	Unknown
<i>Blotiella trichosora</i> Pic.Serm.	A(i)	✓	✓	✓	—	—	Occasional

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
Baikiaea-Podocarpus Swamp Forest (VU)	C(i)	✓	✓	✓	173
Freshwater marshes (VU)	C(iii)	—	—	—	7

General site habitats

GENERAL SITE HABITAT	PERCENT COVERAGE	IMPORTANCE
Forest - Subtropical/Tropical Swamp Forest	—	Major
Wetlands (inland) - Permanent Rivers, Streams, Creeks [includes waterfalls]	—	Major
Wetlands (inland) - Permanent Freshwater Marshes/Pools [under 8 ha]	—	Minor
Wetlands (inland) - Seasonal/Intermittent Freshwater Marshes/Pools [under 8 ha]	—	Minor

Land use types

LAND USE TYPE	PERCENT COVERAGE	IMPORTANCE
Agriculture (arable)	—	Minor
Agriculture (pastoral)	—	Minor
Nature conservation	—	Major
Harvesting of wild resources	—	Minor

Threats

THREAT	SEVERITY	TIMING
Agriculture & aquaculture - Livestock farming & ranching - Small-holder grazing, ranching or farming	Low	Ongoing - trend unknown
Agriculture & aquaculture - Annual & perennial non-timber crops - Small-holder farming	Medium	Ongoing - increasing
Biological resource use - Logging & wood harvesting	High	Ongoing - declining
Agriculture & aquaculture - Annual & perennial non-timber crops - Agro-industry farming	Unknown	Future - inferred threat

Protected areas

PROTECTED AREA NAME	PROTECTED AREA TYPE	RELATIONSHIP WITH IPA	AREAL OVERLAP
Malabigambo Central Forest Reserve	Forest Reserve (conservation)	IPA encompasses protected/conservation area	111
Kaiso	Forest Reserve (conservation)	IPA encompasses protected/conservation area	19
Namalala	Forest Reserve (conservation)	IPA encompasses protected/conservation area	24
Tero East	Forest Reserve (conservation)	protected/conservation area encompasses IPA	11
Tero West	Forest Reserve (conservation)	protected/conservation area encompasses IPA	27

Conservation designation

DESIGNATION NAME	PROTECTED AREA	RELATIONSHIP WITH IPA	AREAL OVERLAP
Sango Bay Area	Important Bird Area	protected/conservation area encompasses IPA	188
Sango Bay Area	Key Biodiversity Area	protected/conservation area encompasses IPA	188
Sango Bay-Musambwa Island-Kagera Wetland System	Ramsar	protected/conservation area encompasses IPA	191

Bibliography

Howard, P. C. 1991. **Nature Conservation in Uganda's Tropical Forest Reserves.**

Kalema, J., Simo-Droissart, M. & Tack, W. 2021. **Dasylepis eggelingii. The IUCN Red List of Threatened Species 2021: e.T137580592A138015016..**

Plumptre, A. J., Ayebare, S., Behangana, M., Forrest, T. G., Hatanga, P., Kabuye, C., Kirunda, B., Kityo, R., Mugabe, H., Namaganda, M., Nampindo, S., Nangendo, G., Nkuutu, D. N., Pomeroy, D., Tushabe, H. & Prinsloo, S. 2019. **Conservation of vertebrates and plants in Uganda: Identifying Key Biodiversity Areas and other sites of national importance.** Conservation Science and Practice, Vol 1, page(s) e7

Bakamwesiga, H., Kasoma, P., Katabarwa, D., & Pomeroy, D. 2000. **Conservation of Biodiversity in the Sango Bay Area, Southern Uganda.** Journal of East African Natural History, Vol 89, page(s) 37–44

BirdLife International 2022. **Important Bird Areas factsheet: Sango Bay area.**

Byaruhanga, A., & Kigoolo, S. 2005. **Sango Bay-Musambwa Islands-Kagera Wetland System (SAMUKA) Ramsar Information Sheet (RIS).**

Elshehawi, S., Barthelmes, A., Beer, F., & Joosten, H. 2019. **Assessment of Carbon (CO₂) emissions avoidance potential from the Nile Basin peatlands.**

Farjon, A. 2013. **Afrocarpus dawei. The IUCN Red List of Threatened Species 2013: e.T42437A2980222.**

Gereau, R., Beentje, H.J., Kabuye, C., Kalema, J., Luke, W.R.Q., Maunder, M., Mwangoka, M., Nshutiyayesu, S. & Ntore, S. 2017. **Vangueria volkensii var. fyffei. The IUCN Red List of Threatened Species 2017: e.T97224191A97224234.**

Gereau, R., Beentje, H.J., Kabuye, C., Luke, W.R.Q., Nshutiyayesu, S. & Ntore, S. 2019. **Oldenlandia lancifolia var. seseensis. The IUCN Red List of Threatened Species 2019: e.T111324088A111324100.**

IUCN & UNEP-WCMC 2022. **The World Database on Protected Areas (WDPA).**

Kazoora, C., Irumba, D., Smith, N., Mutamba, M., Nkabiheebwa, P., Katumba, G. & Nakiyingi, E. 2019. **A review of collaborative forest management in Uganda.**

Langdale-Brown, I., Osmaston, H. A., & Wilson, J. G. 1964. **The Vegetation of Uganda and its Bearing on Land-Use.**

Luke, Q., Festo, L., Vollesen, K., Kalema, J., Richards, S. & Beentje, H. 2024. **Flora of Sango Bay and Minziro, two Important Plant Areas on the Uganda/Tanzania border.** Journal of East African Natural History, Vol 113(7), page(s) 59–146

NELSAP-CU (Nile Equatorial Lakes Subsidiary Action Program Coordination Unit) 2020. **Monograph for the Sango Bay Minziro (Tanzania-Uganda) Wetland landscape.**

NELSAP-CU (Nile Equatorial Lakes Subsidiary Action Program Coordination Unit) 2021. **Sango Bay-Minziro Transboundary Wetland Conservation Investment Plan.**

Namaganda, M. 2018. **Environmental impacts of oil palm plantations in Kalangala.** Oil palm plantations in forest landscapes: impacts, aspirations and ways forward in Uganda (pub. Tropenbos International)

The Independent 2023. **Leaders demand fresh boundary opening for Sango Bay sugar estates.**

Ssegawa, P., & Kasenene, J. M. 2007. **Medicinal plant diversity and uses in the Sango bay area, Southern Uganda..** Journal of ethnopharmacology, Vol 113(3), page(s) 521-540