

Information Sheet on Ramsar Wetlands (RIS)

Categories approved by Recommendation 4.7, as amended by Resolution VIII.13 of the Conference of the Contracting Parties.

Note for compilers:

1. The RIS should be completed in accordance with the attached *Explanatory Notes and Guidelines for completing the Information Sheet on Ramsar Wetlands*. Compilers are strongly advised to read this guidance before filling in the RIS.
2. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Bureau. Compilers are strongly urged to provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of maps.

LAKE BISINA WETLAND SYSTEM RAMSAR INFORMATION SHEET (RIS)

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2. **Date:** 15 September 2005

3. **Country:** The Republic of Uganda

4. **Name of the Ramsar site:** Lake Bisina Wetland System

5. Map of the Ramsar site:

Hard copy: attached
Digital (electronic) format: yes

6. **Geographical coordinates:** 33°43' - 34° 04" E and 01°32" - 01°53'N

7. General Location:

Lake Bisina wetland system is located in the north east of Uganda in three districts: **Kumi** district (Kafir, Mukura, Kumi and Ongino sub-counties); **Katakwi** district (Wera, Katakwi, Toroma, Kapujan and Magoro sub-counties) and **Soroti** District (Gweri sub-county). It is located 15 kms from Kumi town.

8. **Elevation:** 1,050 m above sea level.

9. **Area:** 54,229 hectares.

10. Overview:

Lake Bisina is a shallow fresh water lake, which covers an area of about 192 km², and is some 32 km long by 6 km wide, with a thin strip of fringing papyrus swamp. Lake Bisina was identified by NatureUganda as an Important Bird Area (IBA) (Byaruhanga *et al* 2001). This is used as a feeding area by wading birds including the globally vulnerable species the Shoebill (*Balaeniceps rex*). *Cyperus papyrus* and *Aeschynomene* species (Papilionoideae) is also scattered in the swamp. It is in the *Cyperus papyrus* where the endemic Fox's Weaver (*Ploceus spekeoides*) was recorded nesting in 1996. The leafless sedge, *Cyperus articulatus*, dominates the shoreline. The water lilies *Nymphaea*, a declining habitat in much of Uganda, dominate the shallow areas of the lake.

Lake Bisina falls outside the Karamoja Protected Area system and there are no conservation measures known or proposed for the lake or the surrounding areas. The lake is very important for the surrounding local communities in terms of fishing, transport, and supply of water for domestic use and livestock as well as food during famine.

The wetland system is also important as a refuge for fish species that have gone extinct in the main lakes including Lake Victoria and Lake Kyoga.

11. **Ramsar Criteria:** 1, 2, 3, 4, 7 and 8.

12. Justification for the application of each criterion listed in 11 above:

Criterion 1: Lake Bisina wetland system forms an unusually extensive wetland in Uganda with a unique macrophyte ecosystem and satellite to Lake Kyoga.

Lake Bisina Wetland system is part of the Lake Kyoga Basin lakes. The lakes are important for their diversity of macrophytes. The macrophytes are a unique habitat in and around the lakes. Within these ecosystems are outstanding plant species, which are endemic or threatened. A rare grass known as *Ulylectrum digitatum* was recorded in the wetland system. An endemic plant known as *Suddia sagitifolia* was also recorded in the wetland system. Until six years ago (A. Katende pers. comm.), this plant was known to occur in southern Sudan. It is now established that the origin of the plant is in the Kyoga Basin lakes and rivers. The macrophytes form an important ecological component of the lake ecosystem. They provide anchorage for Zooplankton and Phytoplankton, which constitute food for fish. They provide breeding shelter for the breeding fish; improve oxygen conditions in water and form hiding places (refugia) for fish.

Criterion 2: Lake Bisina Wetland System supports rare and endangered species

Lake Bisina and the marshes fringing the lake form an unusually extensive wetland in Uganda. There is one globally vulnerable bird species in the wetland system, the Shoebill *Balaeniceps rex*. Other regional threatened species include Great White Egret (*Casmerodius albus*) (Vulnerable), Saddle-billed Stork (*Ephippiorhynchus senegalensis*) (Vulnerable), White-backed Duck (*Thalassornis leuconotus*) (Vulnerable), Blue Quail (*Coturnix adansonii*) (Vulnerable) and Yellow-billed Oxpecker (*Buphagus africanus*) (Vulnerable), as well as other papyrus endemic species (annex 2).

The Nile Crocodile *Crocodylus niloticus* (CITES App. II) has been reported in the wetland system as well as the swamp antelope the Sitatunga *Tragelaphus spekii* (CITES App. III) both of which are globally threatened species. *Pelomys hopkinsi* (Vulnerable) is present too.

Endemic Cichlid fishes considered of conservation concern on account of endemism to the waters of Uganda (recorded only in Lake Bisina) include *Harpogochromis guiarti* (IUCN Red List: CR) and *Oreochromis esculentus* (IUCN Red List: VU).

Criterion 3: Supports populations of plant and animal species important for maintaining the biological diversity of the region.

Lake Bisina is one of the wetlands in Uganda with high biodiversity values / scores based on wetland dependant plants. It is one of the top sites rich in dragonflies, birds and fishes. It is one of the minimum critical networks of wetland sites important for the conservation of wetlands and their biodiversity in Uganda.

Seven Lake Victoria biome species have been recorded in the wetland system, including the Papyrus Gonolek (*Laniarius mufumbiri*) and the Northern Brown-throated Weaver (*Ploceus castanops*), which breeds extensively in the short fringing papyrus. Other interesting Papyrus species include White-winged Warbler (*Bradypterus carpalis*), Carruthers's Cisticola (*Cisticola carruthersi*) and Papyrus Canary (*Serinus koliensis*).

The Lake Bisina Wetland System holds the only endemic bird species for Uganda, the Fox's Weaver (*Ploceus spekeoides*). This site has over 100 species of Butterflies and *Borbo perobscura*, *Cupidopsis jobates*, *Hypolimnys misippus*, and *Lachnocnema brimo* have only been recorded at Lake Bisina. *Calotis antevippe* and *Harnanumida daedus* have restricted range only recorded in Lake Opeta and Lake Bisina.

A rare grass known as *Ulylectrum digitatum* and an endemic plant known as *Suddia sagitifolia* occur in and around Lake Bisina. A species with restricted range belonging to family Hydrocharitaceae, *Ottelia fischeri* has also been recorded in the wetland.

The satellite lakes of L. Kyoga region have wide fish taxa, which include both known species and several undescribed species. Lake Bisina contains more than 30 *Haplochromine* species some of which have been reported extinct or rare in the Lake Victoria region due to introductions such as Nile Perch *Lates niloticus*.

Criterion 4: Lake Bisina Wetland System supports bird and animal species at a critical stage in their life cycles.

Lake Bisina wetland is considered to be of great importance for the conservation of birds (Byaruhanga. *et al*, 2001) and the wetland system across to Lake Opeta has the only breeding

records for the Fox's Weaver (*Ploceus spekeoides*). Fishermen on the two lakes indicate that the Shoebill (*Balaeniceps rex*) is regularly seen around the lakes and breeds in the surrounding swamps fringing the lakes. The lake and wetland system is a major migration stopover for birds including terns, gulls and waders. The wetland is located at the edge of an arid region and provides refuge for many species during the dry season. The wetland system also becomes the sole source of livelihoods for the local communities and nomadic Karamajong people during the dry seasons.

The minor satellite lakes of the Lake Kyoga region act as nursery beds for fish. Protection of Lake Bisina along with the swamps associated with it might play a significant role in the conservation of the fish species, especially the *Haplochromines*.

Criterion 7: Lake Bisina supports species of indigenous Cichlid fishes including endemic *Haplochromines* and other swamp fish species.

Fish species diversity in the open water of Lakes Victoria and Kyoga has been reduced by the introduction of the Nile perch, *Lates niloticus*. About 200 out of more than 600 *Haplochromine* species in Lake Victoria are feared to have become extinct. Studies have shown that fish species which may have been depleted by the Nile Perch in Lake Victoria, still survive in the satellite lakes of the Lake Kyoga region. The minor satellite lakes act as nursery beds that generated "prototypes" that later moved into the larger systems, and may generate species through allopatric isolation and local selection regimes at the same pace as larger lakes. The indigenous fishes supported by Lake Bisina wetland system include *Harpagochromis guiarti*, *Oreochromis esculentus*, *Allochromis*, *Astatotilapia latifasciata*, *Prognathochromis*, *Lipochromis*, *Pscichromis* and *Tridontochromis* (Annex 1). *Oreochromis esculentus* and *Harpagochromis guiarti* are important species which are associated with wetland benefits.

Criterion 8: Lake Bisina Wetland System is an important spawning ground and or nursery on which fish stocks within the wetlands and Kyoga lakes depend.

Lake Bisina wetland system is an important spawning ground for the indigenous fish species. Being a shallow lake system, the Nile perch *Lates niloticus* could not survive in the system's environment. As a result the system is a fish breeding refuge for the indigenous species some of which have been depleted in the main lakes Kyoga and Victoria.

13. Biogeography:

Lakes Kivu, Edwards, George and Victoria (and satellite lakes) Freshwater Ecoregion (from WWF's "Freshwater Ecoregions of Africa" classification). The fresh water bodies influence the biogeography of the Lake Bisina wetland system. The area is largely dominated by wooded savanna interspersed with cultivated gardens and human settlement.

14. Physical features of the site:

Climate: The Climate around Lake Bisina is tropical in nature. Air currents such as the southeast and northeast monsoons influence the climate of the wetland system. The wetland system falls in the Karamoja region climatic zone (State of environment report 2002). The area experiences two seasons: the rainy and dry season, and it receives a bi-modal low rainfall ranging from 1,000 – 1,500 mm (state of environment report 1998). The first rainy season is in the months of April, May, and June and second rains fall in the month of September, October and November. Mean annual rainfall is about 1000 mm and mean annual maximum temperatures from 30 - 32.5°C. Higher temperatures are experienced in the westerly Plains. Mean minimum temperature ranges from 15 - 17.55°C. The mean temperatures range from 17.4°C to 26.7°C. Because of this temperature range, the system has a relatively high evapotranspiration ranging between 1750 – 1900 mm (State of environment report, 1998). Lake Bisina has almost equal length of day and night throughout the year, with a growing season of 240 days.

Hydrology: the major River entering the lake is the Apedura, which flows from the north. The river has a floodplain 30 km long and up to 6.5 km wide. Previously the main watercourses of the Kyoga region had flowed westward from old Miocene watershed, but now they are almost leveled and on the western side of the basin their flow has actually been reversed. A glance at a map of Uganda will show that Lake Kyoga, through which the waters of Lake Victoria flow into the Nile, represents the flooded branch of a westward flowing river. It is reported that during the Pleistocene period (involving the past 300,000 years or more) earth movements have made large changes in the distribution of the waters in the Lake Victoria basin, but it has always been a rather shallow pan some 500 miles wide and deeper towards the east where the lake lies.

Lake Bisina has pH range of 7.6 to 9.0 and its Alkalinity is 2.35 meq/l. Conductivity for the lake is 365×10^{-5} s/cm. No information is available on major ions and nutrients, and on water depth fluctuations.

Geology

Lake Bisina wetland system is underlain by a mixture of Pre-Cambrian rocks, which include wholly granitized rocks of watian of west Nile, Banded gneisses of Aruan tectonic age and Cenozoic rocks of Pleistocene to recent (Atlas of Uganda, 1967). The rock types in the watian of west Nile include acid and intermediate granulites and charnockites, quartz diorites, banded, porphyroblastic and quartz – feldspathic types. The rock types comprising the Banded gneisses of Aruan tectonic Age include biolite gneisses, banded migmatitic and granite gneisses with lesser qualities of hornblende basic pods.

Soil types:

The above rocks have given rise to the vertisols topographic not differentiated soils with patches of eutrophic soils of tropical regions on volcanic ash, and patches of ferruginous tropical soils on crystalline acid soils mainly freely drained complex with black clay. Vertisols predominate the area. Predominant soil types (FAO) include yellowish ferrallitic soils on sandy sediments and gleysols soils. The soils have a characteristic high content of swelling and shrinking clay lattice (2:1), which, under dry climatic conditions, become very hard and difficult to work. Similarly they are difficult to work under wet conditions, because they expand and become excessively moist and sticky.

Lake Bisina wetland system is predominantly situated in the Sudanian regional centre of endemism to the north of the lake. The vegetation is predominantly fire – climax secondary grassland, and cultivation, but the natural vegetation is a wooded savanna (State of environment report 2002).

15. Physical features of the catchment area:

Lake Bisina wetland system catchment area is made up of two geomorphic units, the miscellaneous alluvial and the Lake Sediments on Tanganyika surface geomorphic units (Aniku, 1996). The geomorphic units make up many of the peculiarities of landscape and soil patterns in the catchment. The later geomorphic unit dominates. The geomorphic units are bisected to form a drainage system in which rivers in the catchment flow. The major catchment areas are through River Apeduru and Akokoro from the north. The system is contiguous with Opeteta wetland system that has a large catchment including Mt. Elgon through rivers such as Sironko and Ukutat from the east (Map of Uganda 2001). The catchment is largely dominated by wooded savanna interspersed with cultivated gardens and human settlement. The features of the catchment are relatively similar to those of the site (refer to section 14).

16. Hydrological values:

A large amount of water flows through streams to lakes and rivers to the north and east. The system plays an important hydrological role for the waters entering Lake Kyoga. The main hydrological function of the system is water storage, flood control particularly from Karamoja areas and slopes of Mt. Elgon, sediment retention and water purification. During the dry season, the system maintains a steady discharge of water and supplements the water supply to the surrounding areas including Karamoja cattle keepers, which migrate to the vicinity of the wetland in search of pasture.

The system also plays a role in trapping sediments carried from the surrounding catchments in times of heavy run-off and hence reduces the level of sediments carried to Lake Kyoga, thereby helping to maintain the natural conditions important for the survival of many fish species.

17. Wetland Type in order of importance:

O (permanent freshwater); **Tp** (permanent freshwater marshes), **Ts** (seasonal freshwater wetland).

18. General ecological features:

The south-western end of the lake begins with a shallow part dominated by submerged and partially submerged plants such as *Nymphaea* species, *Najas pectinata* and *Ceratophyllum demersum*. The main vegetation community is *Vossia* in the deeper waters and occasionally *C.*

papyrus and *Aeschynomene* sp. (Papilionoideae). *Oryza longistaminata* a wild rice variety is sometimes recognized on the shallower ends of the lake. The leafless sedge, *Cyperus articulatus* dominates the shoreline. The southwestern shallow water area of the lake dominated by *V. cuspidata* consists of a marsh and it is this marsh that is important for bird species.

Main habitats and vegetation types in and around Lake Bisina include: *Echinochloa ugandensis*, which grows extensively in the swamp forming strong mats on the edges of the marsh. Stunted looking Papyrus is scattered in the swamp. Natural vegetation in adjacent areas consists of *Hyparrhenia* grass savannah. A wooded *Butyrospermum* savannah dominates the adjacent areas.

19. Noteworthy flora:

Lake Bisina supports an unusually big number of macrophyte plant species (over 77 macrophytes have been recorded). Noteworthy flora includes a restricted range species – *Ottelia fischeri*, belonging to family Hydrocharitaceae; *Oryza longistaminata* a wild variety of rice is sometimes recognized on the shallower ends of the lake. Others to note include: *Ulyectrum digitatum*, a rare grass and *Suddia sagitifolia*, an endemic plant.

20. Noteworthy fauna:

Globally threatened and near-threatened bird species: Shoebill (*Balaeniceps rex*), Fox's Weaver (*Ploceus spekoides*) and the Papyrus Gonolek (*Laniarius mufumbiri*). The Fox's Weaver is common in the vicinity of water at least during the breeding season. Breeding of Fox's Weaver has only been recorded in this wetland in the last two decades.

Other bird species include the near-threatened Grey Heron (*Ardea cinerea*), Purple Heron (*Ardea purpurea*), African Marsh Harrier (*Circus ranivorus*), Grey Crowned Crane (*Balearica regulorum*), and Lesser Jacana (*Microparra capensis*).

The Sitatunga (*Tragelaphus spekii*) and *Pelomys hopkinsi* are 1996 IUCN Red listed animals.

Four rare species of butterflies *Borbo perobscura*, *Cupidopsis jobates*, *Hypolimnus misippus*, and *Lachnocnema brimo* are recorded only at Lake Bisina.

21. Social and cultural values:

Lake Bisina serves the local communities around it as a source of fish at both subsistence and commercial level. Until 1950, Lake Bisina was fished only by the local people using long lines and baskets. At the end of 1950 a gill-net fishery was started for *Tilapia esculenta* and *T. variabilis*. Cultivation is carried out in the wetland areas. Crops grown include: maize, millet and plantain. The lake is also used as a source of water for livestock and domestic use. It is also used as a source of food during prolonged droughts, e.g. a rhizome of genus *Nymphaea* is used as food during droughts. The lake is also used for inter-district transport connections.

22. Land tenure / ownership:

a) Within the Ramsar Site:

According to the 1995 Constitution, wetlands are held in trust by the government for the people. The Government of Uganda therefore owns Lake Bisina wetland System.

b) In the surrounding area:

Land in the surrounding areas is under customary ownership

23. Current land (including water) use:

Lake Bisina wetlands are mainly used for fishing. The area is also used as source of water for livestock and domestic water supply.

There is subsistence farming and livestock grazing activities going on in the catchments area around the wetland. Lake Bisina is a major link between Katakwi and Kumi districts through a canoe ferry system.

24. Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land (including water) use and development projects:

Threats from within the Site

Over-fishing and use of poor fishing methods as a result of commercial fishery requires implementation of conservation measures. Hunting for the Sitatunga is of conservation concern.

Threats from surrounding / catchments area

Poor farming methods and low environmental awareness may be contributing to the deterioration of the ecological system of Lake Bisina. Habitat degradation as a result of grazing is also an important factor against the conservation of the ecosystem.

25. Conservation measures taken:

The area is not well known and little information on biodiversity exists. Lake Bisina falls outside the Karamoja Protected Area system and there are no conservation measures known or proposed for the lake or the surrounding wetlands. Lake Bisina is one of Uganda's 30 Important Bird Areas that was identified by *Nature*Uganda. *Nature*Uganda has been promoting conservation of the area and lobbying the relevant institutions to raise its conservation status. The local communities living around the Lake Kyoga region formed the Lake Kyoga Fisheries Association to promote sustainable fisheries development and sensitize the local communities about bad and good methods of fishing.

26. Conservation measures proposed but not yet implemented:

The local communities with assistance from the Wetland Inspection Division have prepared a community based management plan for Lake Bisina Wetland system and now proposed for Ramsar designation. The plan is due for implementation. It contains components for income generation support, water and soils conservation, and wetland restoration, including the development of by-laws among others.

27. Current scientific research and facilities:

The Fisheries Resources Research Institute (FIRRI) in collaboration with the University of Florida has carried out a number of studies in the Lake Kyoga basin including Lake Bisina. *Nature* Uganda has also been conducting regular bird counts on the lake. Makerere University Institute of Environment and Natural Resources has carried out research on different taxa.

28. Current conservation education activities related to communications, education and public awareness (CEPA) related to or benefiting the site:

Nature Uganda has been promoting conservation efforts from district to local levels for the management and conservation of Lake Bisina Wetland System. The Fisheries Resources Research Institute (FIRRI) organized a sensitization towards efficient utilization and sustainable exploitation of the Kyoga basin resources.

29. Current recreation and tourism:

Currently, there is no significant activity by way of tourism and recreation. However, the area is a potential site, especially given the proximity to the Kyoga minor lakes. The districts should take the initiative to develop the tourism sector.

30. Jurisdiction:

- a) Territorial - Kumi District Local Government and its lower councils; Katakwi District Local Government and its lower councils; and Soroti District Local Government and its lower councils.
- b) Functional – National Environment Management Authority, District Environment Officers, District Fisheries Officers and Wetlands Inspection Division.

31. Management authority:

According to the 1995 Constitution, wetlands are held in trust for the people by the government. Functionally therefore Lake Bisina wetlands are in the hands of the Central Government. The 1997 Local Government Act devolved the wetland management to the District Local Governments.

Therefore, the management authorities are:

1. Kumi District Local Government
(Kapir, Mukura, Kumi and Ongino Sub-Counties)
P. O Box 44,
Kumi
UGANDA
2. Katakwi District Local Government
(Wera, Katakwi, Toroma, Kapujan and Magoro Sub-Counties)
P. O Box Private Bag,
Katakwi
UGANDA
3. Soroti District Local Government
(Gweri Sub-County)
P. O Box 61,
Soroti
UGANDA

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