

Information Sheet on Ramsar Wetlands (RIS) – 2006-2008 version

1. Name and address of the compiler of this form:

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Designation date

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Site Reference Number

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2. Date this sheet was completed/updated:

November 2006

3. Country:

Nigeria

4. Name of the Ramsar site:

Maladumba Lake

5. Designation of new Ramsar site or update of existing site:

This RIS is for (tick one box only):

- a) Designation of a new Ramsar site ; or
b) Updated information on an existing Ramsar site

6. For RIS updates only, changes to the site since its designation or earlier update:

7. Map of site:

a) A map of the site, with clearly delineated boundaries, is included as:

- i) a hard copy (required for inclusion of site in the Ramsar List): ;
ii) an electronic format (e.g. a JPEG or ArcView image) ;
iii) a GIS file providing geo-referenced site boundary vectors and attribute tables .

b) Describe briefly the type of boundary delineation applied:

The boundary of the site follows the shore of the lake plus an additional buffer (mainly vegetation), larger on the west side, smaller on the east side (dam)

It is important to note that the size of the lake changes with the season and the natural drawdown rhythms. There is an adjoining Forest Reserve with permanent boundary, though not respected by the local communities.

8. Geographical coordinates (latitude/longitude, in degrees and minutes):

10°24'N 9°51'E (Latitude 10,41 and Longitude 9,85 decimal degrees)

9. General location:

Maladumba Lake is one of several natural lakes and pools in Bauchi State, central northern Nigeria. It is located in the Maladumba Lake and Forest Reserve, approximately 18 km SW of Misau and 2 km east of Shelong (500), a fishing village, in the Misau Local Government Area, in that pan-handle-like northeastern landmass of Bauchi State (2006 population: 4,676,465). The lake is approximately 120 km (as the crow flies) northeast of Bauchi (400,000), the State capital. A major National Park, the Yankari National Park, and a Forest and Game Reserve, the Lame/Burra Forest and Game Reserve are also in Bauchi State. The Park and Reserve are located 75 km southeast and 60 km northwest of Bauchi, respectively. The Lame/Burra Reserve is approximately 105 Km southwest of the Maladumba Lake.

10. Elevation:

550m a.s.l.

11. Area: (in hectares)

1859,59 hectares

12. General overview of the site:

Provide a short paragraph giving a summary description of the principal ecological characteristics and importance of the wetland.

Maladumba Lake is a natural lake located in the Sudan Savanna of central northern Nigeria. It is a shallow (\cong 2m) depression lake, situated in a structurally-guided, counter clockwise and clockwise semi-circular drainage line occupied by the River Kuka that drains into the lake, and River Kari that drains the lake during high water. The lake is undergoing accelerated siltation.

The surrounding Forest Reserve (51.8 km²) is severely degraded but contains a total of 175 plant species including 26 ligneous species (e.g. *Acacia kamerunensis*, *Acacia nilotica*, *Combretum nigricans*, *Combretum molle*, *Tamarindus indica*, *Holarrhena floribunda*, *Burkea africana*, *Anogeissus leiocarpa*, *Adansonia digitata*). Animals observed include the African buffalo (*Syncerus caffer*), bushbuck (*Tragelaphus scriptus*), aardvark (*Orycteropus afer*), civet (*Civettictis civetta*), genet (*Genetta* sp.), porcupine (*Atherurus africanus*), Patas monkey (*Erythrocebus patas*), and monitor lizard (*Varanus* sp.). The local communities harvest wild resources from the lake and the reserve, while pastoralists graze the open grassland and the drawdown area during the dry season. There is also some cultivation (fadama farming) in the

area. The lake and reserve are gazetted but are not accorded the required protected area status and this makes it vulnerable to degradation.

13. Ramsar Criteria:

1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9

14. Justification for the application of each Criterion listed in 13 above:

Criterion 1:

The site is representative of the natural wetlands of the Sudan Savanna in Nigeria. Maladumba Lake and the adjoining wetlands have a unique assemblage of plants and animal species located in the Sudan savanna bio-geographical region, in a single limited location.

The Maladumba is a Sudan Savanna shallow depression lake that supports large numbers of migrant bird species, including inter-African and Palearctic birds (82 bird species in all). Bird species include Ruff (*Philomachus pugnax*), Grey Heron (*Ardea cinerea*), Lizard Buzzard (*Kaupifalco monogrammicus*), white-necked stork (*Ciconia episcopus*), Hartlaub's duck (*Pteronetta hartlaubii*), Senegal coucal (*Centropus senegalensis*), and Green Fruit Pigeon (*Treron australis*). The lake hosts twenty-nine recorded fish families. Some of these are of economic importance (*Gymnarchus niloticus*, *Lates* sp., *Bagrus* sp., *Hydrocynus* sp.)

Criterion 3:

Maladumba Lake supports populations of plants and animal species important for maintaining the biological diversity of the Sudan Savanna biogeographical zone. It is a biodiversity hotspot with viable populations of monitor lizards (*Varanus s*), grass cutters (*Thyonomys swinderianus*) and bird species including grey heron (*Ardea cinera*), ruff (*Philomachus pugnax*) and other water birds. It also has a very high biodiversity of fish species and plays a prominent role in protein supply of the people as well as enhancing local economy through commercial fishing.

Criterion 4:

It supports bird species at a critical stage in their life cycle and provides refuge during winter conditions in their home niche. It supports large numbers of migrant bird species, which winter and/or breed on and around the lake. Examples include: Ruff (*Philomachus pugnax*), Grey Heron (*Ardea cinerea*), Lizard Buzzard (*Kaupifalco monogrammicus*), white-necked stork (*Ciconia episcopus*), Hartlaub's duck (*Pteronetta hartlaubii*), Senegal coucal (*Centropus senegalensis*), and Green Fruit Pigeon (*Treron australis*). There are inter-African and palearctic birds (82 bird species in all).

Criterion 7:

The lake hosts twenty-nine recorded fish families. Some of these are of economic importance (the African Knife fish (*Gymnarchus niloticus*), *Lates* sp., *Bagrus* sp., *Hydrocynus* sp.).

15. Biogeography

a) biogeographic region:

Sudan Savanna

b) biogeographic regionalisation scheme (include reference citation):

Keay R.W.J. (1959a). An outline of Nigerian vegetation. Lagos: Government Printer

Keay R.W.J. (1959b) Derived savanna: derived from what? Bulletin de l'Ifan 21: 427-438

Keay R.W.J. (1960) An example of Northern Guinea Zone vegetation in Nigeria. Nigeria Forestry Information Bulletin No 4. Lagos: Government Printer

16. Physical features of the site:

Maladumba Lake is a natural, shallow (\cong 2m) depression lake, situated in a structurally-guided long, counter clockwise and clockwise semi-circular channel occupied by the River Kuka that drains into the lake, and River Kari that partially drains the lake during high water. The lake is undergoing accelerated siltation.

Maladumba Lake lies on sedimentary rocks of the Kerri Kerri Formation. The Formation comprises lacustrine and deltaic-type sediments of Paleocene age deposited on the Basement Complex to a thickness of up to 200m. The formation is predominantly arenaceous, consisting of loosely cemented sands and grits, clayey sandstones, massive clays and silts. Bands of ironstone and conglomerate occur locally. The Formation thins towards its surface unconformity with the Basement Complex in the area west of the lake. In this area, the River Jimin, the main tributary of the Kari, has incised through the formation to flow on crystalline rocks of the Basement Complex. The soils in the area are deep sandy clay and loamy sands.

The Maladumba Lake is situated on the Kerri Kerri plateau, at an elevation of approximately 500m (Beti Hill approximately 8km SW of Misau on the road to Maladumba Lake has a peak elevation 520m). The plateau slopes northeastwards towards the Lake Chad. The Maladumba Lake occupies a depression near the south-facing scarp of the plateau. The Lake is approximately 5 km long and 300 – 400m wide, and less than 2m deep. The dimension declines to less than 2km long and 100m wide during the dry season. During this season, the drawdown areas are grassy and are grazed by domestic animals. The streams tributary to the lake are heavily sediment-laden during the rainy season, and the adjoining cultivated lands (though in a Reserve!) also contribute sheet flow to the lake. It is thus estimated that the lake could be silted up in 50 years if soil conservation measures are not adopted in the lake's catchment.

The water quality of the lake was determined by Development Research Bureau (2004) and was reported, among others, as follows: pH 7.6; Total Solids load 750 mg/L; and Dissolved Oxygen 5.9 mg/L.

The climate is the Koppen's A_{w2} Tropical Wet and Dry or Sudan type climate, with two distinct seasons, a short (May-September) wet season and a longer (October-April) dry season. Mean annual rainfall is 800mm with a unimodal distribution during the rainy season. The peak of the season is between July and August. Rainfall is usually stormy and with high intensity. Mean temperatures range from 26°C during the harmattan to 34°C during the hot month of April and May. The dry season is dominated by dusty, northeasterly Harmattan winds.

17. Physical features of the catchment area:

Maladumba Lake and its surrounding Forest Reserve lie on sedimentary rocks of the Kerri Kerri Formation. The Formation comprises lacustrine and deltaic-type sediments of Paleocene age deposited on the Basement Complex to a thickness of up to 200m, and is predominantly arenaceous, consisting of loosely cemented sands and grits, clayey sandstones, massive clays and silts. Bands of ironstone and conglomerate occur locally. The Formation thins towards its surface unconformity with the Basement Complex in the area west of the Maladumba Lake. In this area, the main river, Komadugu Gana, has incised through the formation to flow on crystalline rocks of the Basement Complex. The soils in the area are deep sandy clay and loamy sands. The Kerri Kerri Plateau, at an elevation of approximately 500m is the main topographical feature in the area. The plateau slopes northeastwards towards the Lake Chad. The Maladumba Lake occupies a depression near the south-facing scarp of the plateau.

The climate is the Koppen's A_{w2} Tropical Wet and Dry or Sudan type climate, with two distinct seasons, a short (May-September) wet season and a longer (October-April) dry season. Mean annual rainfall is 800mm with a unimodal distribution during the rainy season. The peak of the season is between July and August. Rainfall is usually stormy and with high intensity. The dry season is dominated by dusty, northeasterly Harmattan winds.

18. Hydrological values:

The main river in the area is the Kari, a tributary of the Komadugu-Gana, which drains into the Lake Chad. The Kari drains the Maladumba Lake during the high water season (August-September). The Kuka and other smaller streams that drain into the Maladumba Lake are sediment-laden during storm induced runoff events. The lake is a sediment trap and is undergoing accelerated siltation. Its tributary rivers and sheet flow from the surrounding exposed surfaces bring in huge quantities of sediment before overflow begins to occur into R. Kari. It is estimated that the lake could be silted up in 50 years if soil conservation measures are not urgently adopted in the lake's catchment.

Ground water occurs mainly under water table conditions in the area. The lake and rivers are influent and thus recharge ground water aquifers, but the low permeability of the Kerri Kerri Formation sediments ensure that recharge is limited to the immediate area of the lake and rivers. Consequently, ground water ridges have grown in size, and the consequent potential increase in lake size has been inhibited by the long-term droughts that have plagued the area.

Lake Maladumba provides water used for domestic purposes and traditional irrigation agriculture. Also, Shelong, a fishing community is located 2 km E of the lake.

19. Wetland Types**a) presence:**

Inland: L • M • N • O • P • Q • R • Sp • Ss • Tp • Ts • U • Va •
Vt • W • Xf • Xp • Y • Zg • Zk(b)

b) dominance:

O, Tp

20. General ecological features:

The Maladumba is a Sudan Savanna shallow depression lake that is undergoing accelerated siltation. It supports large numbers of migrant bird species, including inter-African and Palearctic birds (82 bird species in all). Bird species include Ruff (*Philomachus pugnax*), Grey Heron (*Ardea cinerea*), Lizard Buzzard (*Kaupifalco monogrammicus*), white-necked stork (*Ciconia episcopus*), Hartlaub's duck (*Pteronetta hartlaubii*), Senegal coucal (*Centropus senegalensis*), and Green Fruit Pigeon (*Treron australis*). The lake hosts twenty-nine recorded fish families. Some of these are of economic importance (*Gymnarchus niloticus*, *Lates* sp., *Bagrus* sp., *Hydrocynus* sp.). The surrounding forest reserve (51.8 km²) is degraded but contains a total of 175 plant species including 26 ligneous species (e.g. *Acacia kamerunensis*, *Acacia nilotica*, *Combretum nigricans*, *Combretum molle*, *Tamarindus indica*, *Holarrhena floribunda*, *Burkea africana*, *Anogeissus leiocarpa*, *Adansonia digitata*). Animals observed include the African buffalo (*Syncerus caffer*), bushbuck (*Tragelaphus scriptus*), aardvark (*Orycteropus afer*), civet (*Civettictis civetta*), genet (*Genetta* sp.), porcupine (*Atherurus africanus*), Patas monkey (*Erythrocebus patas*), and monitor lizard (*Varanus* sp.).

21. Noteworthy flora:

The Maladumba Forest Reserve (51.8 km²) is degraded but contains a total of 175 plant species including 26 ligneous species (e.g. *Acacia kamerunensis*, *Acacia nilotica*, *Combretum nigricans*, *Combretum molle*, *Tamarindus indica*, *Holarrhena floribunda*, *Burkea africana*, *Anogeissus leiocarpa*, *Adansonia digitata*). These are typical Sudan savanna species. Leaves, fruit, root, stem and bark of some of these species are harvested for food and medicinal purposes. The others are harvested as fuel wood and timber. The continued decimation of the vegetation further exposes the wildlife and accelerates the ageing and elimination of the lake through siltation. DRB (2004) reports that only one grass species; *Imperata cylindrica* was recorded during the survey. This underscores the extent of soil degradation in the area.

Echinochloa sp. and *Oryza* sp. occur in the marshes fringing the lake. There are also some beds of *Typha australis* and *Mimosa pigra* in these areas. These offer protection to fish and serve as breeding grounds.

22. Noteworthy fauna:

The lake supports large numbers of migrant bird species, including inter-African and Palearctic birds (82 bird species in all). These winter and/or breed on and around the lake. Bird species include ruff (*Philomachus pugnax*), Grey Heron (*Ardea cinerea*), Lizard Buzzard (*Kaupifalco monogrammicus*), white-necked stork (*Ciconia episcopus*), Hartlaub's duck (*Pteronetta hartlaubii*), Senegal coucal (*Centropus senegalensis*), Green Fruit Pigeon (*Treron australis*), Ruff (*Philomachus*). The lake hosts twenty-nine recorded fish families. Some of these are of economic importance (*Gymnarchus niloticus*, *Lates niloticus*, *Bagrus bayad*, *Hydrocynus lineatus*, *Arius laticutatus*, *Alestes longipinnis*). Animals observed include the African buffalo (*Syncerus caffer*), bushbuck (*Tragelaphus scriptus*), aardvark (*Orycteropus afer*), civet (*Civettictis civetta*), genet (*Genetta* sp.), porcupine (*Atherurus africanus*), Patas monkey (*Erythrocebus patas*), and monitor lizard (*Varanus* sp.) These have been severely decimated through hunting and habitat destruction.

23. Social and cultural values:

a) Describe if the site has any general social and/or cultural values e.g., fisheries production, forestry, religious importance, archaeological sites, social relations with the wetland, etc. Distinguish between historical/archaeological/religious significance and current socio-economic values:

The lake and Forest Reserve are utilized for fishing, water for domestic and irrigation purposes, hunting, farming, grazing and recreation. The most important activities the lake and reserve support however, in terms of intensity of utilization, are fishing, recreation and farming. In the survey by DRB (2004), some people in Shelleng, a well-known fishing community located 2 km west of the lake, claimed they do not catch fish in the lake but only graze their cattle around it. Many community people likewise deny that they hunt in the reserve. This however may be a new development given the current resource conservation enlightenment campaign in the area. In reality, community people collect all the resources in the lake and the surrounding Forest Reserve – fish, game, firewood, lumber, water, wild fruits and medicinal plants. In particular, the leaves, fruits, roots, stems and bark of some of the plant species are harvested for food and medicinal purposes. The others are harvested as fuel wood and timber. The lake serves as a major source of protein and income to individuals in the area. The local communities harvest wild resources from the lake and the reserve, while pastoralists graze the open grassland and the drawdown area during the dry season. Numerous fisher folk from far and near take advantage of the resources provided by the lake and are reported to make big catches. The Local Government administration in addition organizes annual fishing festivals. A study by the Development Research Bureau (DRB) in 2004 indicates that 80% of the people interviewed have access to the resources of the Lake and the Forest Reserve (wild life, fruits, medicinal plants, fuel wood and water). There is also some cultivation (fadama farming) in the area.

The Local Government administration organizes annual fishing festival on the lake. The lake and reserve are gazetted but are not accorded the required protected area status and this makes it more vulnerable to degradation.

b) Is the site considered of international importance for holding, in addition to relevant ecological values, examples of significant cultural values, whether material or non-material, linked to its origin, conservation and/or ecological functioning?

If Yes, tick the box and describe this importance under one or more of the following categories:

iii) sites where the ecological character of the wetland depends on the interaction with local communities or indigenous peoples:

The site, through grazing, farming and harvesting of wild resources supports community livelihood and if community activities are not regulated, the ecological character of the wetland may be impaired.

24. Land tenure/ownership:

a) within the Ramsar site:

The lake is a major common resource without any specific management policy or guideline. The Misau Local Government however attempts to regulate the use of the resources. Though

Federal and State Laws alienate the communities, more so since the area was designated as a Forest Reserve, the people operate as owners of the wetlands and adjoining territory. The Federal Government owns, by law, all the land in Nigeria and private ownership is contingent upon the issuance of a Certificate of Occupancy by a State Governor. Even this can be revoked if the government needs the land. However, government being far away (poor policing) in many instances, the local people use land as owners until evicted.

b) in the surrounding area:

Right of ownership of land in Nigeria is vested in the Federal Government by law, though the occupants operate as owners until evicted and compensation paid for artefacts on the land whenever the government (Local, State or Federal) actually requires it.

25. Current land (including water) use:

a) within the Ramsar site:

Fishing, hunting of birds, irrigation farming in the drawdown areas, and annual fishing festival.

b) in the surroundings/catchment:

Grazing, farming, hunting, Forest Reserve

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

a) within the Ramsar site:

The tributary rivers of the lake and sheet flow from the surrounding exposed surfaces deposit huge quantities of sediment in the lake. Given that the lake overflows only late in the rainy season, it operates as a sediment trap. It is therefore undergoing accelerated siltation and it is estimated that it could be silted up in 50 years if soil conservation measures are not urgently adopted in the lake's catchment. Fishing and hunting are not currently regulated, and these may unsustainably deplete the lakes fauna. The continuing decimation of the vegetation further exposes the wildlife and accelerates the ageing and elimination of the lake through siltation.

b) in the surrounding area:

River Kuka and other smaller streams that drain into the Maladumba Lake are sediment-laden during storm induced runoff events. Its tributary rivers and sheet flow from the surrounding exposed surfaces bring in huge quantities of sediment before overflow begins to occur into R. Kari.

Forest fires in the dry season, induced by pastoralists who need fresh grasses for their livestock and hunters rounding up game animals, have been devastating because of wrong timing and indiscriminate use of a tool that is acknowledged as helpful to Savanna ecology (Afolayan, 1974). At present, the catchment area including the reserve is largely under cultivation and livestock graze the area covered by grass. Fuel wood and lumber are collected without restraint; consequently the forest is highly degraded. These have promoted soil erosion, with a high sediment delivery ratio, making the lake very turbid in the rainy season. Animals in the Reserve have been severely decimated through hunting (poaching for meat) and habitat destruction. There is no anti-poaching patrol. The Local

Government staff only report activities going on in the site to the State Department of Forestry and Fisheries.

27. Conservation measures taken:

a) List national and/or international category and legal status of protected areas, including boundary relationships with the Ramsar site:

In particular, if the site is partly or wholly a World Heritage Site and/or a UNESCO Biosphere Reserve, please give the names of the site under these designations.

The management practices and policies for Forest Reserves in Nigeria are contained in the Wild Animal Law of 1963 as amended by Edict of 1971. The policies are not different from the management practices and policies of the National Park (Act No 46 of 1999) except that in the Forest Reserve, State Government staff is implementing the Law. Presently, there is no enforcement of any specific management practice on ground for the management of Maladumba Lake/Forest Reserve except that the reserve is being controlled by the Bauchi State Government and monitored by the Department of Forestry and Fisheries and Misau Local Government administration. The Forest Reserve is gazetted but the lake is not accorded the required protected area status.

b) If appropriate, list the IUCN (1994) protected areas category/ies which apply to the site (tick the box or boxes as appropriate):

Ia ; Ib ; II ; III ; IV ; V ; VI

c) Does an officially approved management plan exist; and is it being implemented?:

Yes; No

d) Describe any other current management practices:

None

28. Conservation measures proposed but not yet implemented:

e.g. management plan in preparation; official proposal as a legally protected area, etc.

The Maladumba Lake and Forest Reserve is being proposed as a conservation area of concern under the GEF component of the GEF/World Bank micro-watershed project

29. Current scientific research and facilities:

Bauchi State Department of Forestry has compiled some information on the site. The Tafawa Balewa University, Bauchi State Project Support Unit/ Local Empowerment and Environmental Management Project (BSPSU/LEEMP) and Development Research Bureau have also carried out basic research work. Some investigative work has been done by an NGO, Savanna Conservation Nigeria.

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

The site is being promoted and its potentials highlighted in various forum and publications (BSPSU/LEEMP 2006; DRB 2004). Students on excursion from different institutions in Nigeria have also been visiting the site.

31. Current recreation and tourism:

The Annual Fishing Festival organized by the Misau Local Government. Individuals, foreign and local visit the site but there is no organized coordination of these activities.

32. Jurisdiction:

Include territorial, e.g. state/region, and functional/sectoral, e.g. Dept of Agriculture/Dept. of Environment, etc.

Bauchi State Department of Forestry and Fisheries and the Misau Local Government

33. Management authority:

None currently

34. Bibliographical references:

Afolayan, T.A. (1974): Methods for assessing the effects of hunting and grazing on different vegetation communities in Savanna woodland. Kainji Lake Research Institute. 25p

BSPSU/LEEMP, (2006): Report on Maladumba Lake and Forest Reserve and the Global Environment Facility Component of LEEMP Intervention

Development Research Bureau (DRB) (2004): Report on ecological survey for Maladumba Lake and forest reserve. Submitted to Project Manager, LEEMP-Abuja.

Hadejia-Nguru Wetlands Conservation Project (2001): A Survey of Wetlands in Northern Nigeria. A report submitted to the Federal Ministry of Environment, Abuja, Nigeria.

Keay R.W.J. (1959a): An outline of Nigerian vegetation. Lagos: Government Printer

Keay R.W.J. (1959b): Derived Savanna: derived from what? Bulletin de l'Ifan 21: 427-438

Keay R.W.J. (1960): An example of Northern Guinea Zone vegetation in Nigeria. Nigeria Forestry Information Bulletin No 4. Lagos: Government Printer

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