

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

Available for download from http://www.ramsar.org/ris/key_ris_index.htm.

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

Prof. O.O.OGUNKOYA

Department of Geography,

Obafemi Awolowo University, Ile-Ife, Nigeria

olayinkaogunkoya@yahoo.co.uk +234 803 348
6428

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Designation date

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Site Reference Number

Dr. Anthony DAMI

Department of Geography

University of Maiduguri, Maiduguri, Nigeria

tonidamy@yahoo.co.uk +234 805 533 4965

2. Date this sheet was completed/updated:

June 2007

3. Country:

Nigeria

4. Name of the Ramsar site:

Lake Chad Wetlands in Nigeria

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

This RIS is for:

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 glwd vector on the west side and for the rest follows the boundary with the neighbouring countries

The northern boundary of the wetlands is the international border of Nigeria and Niger, while the eastern boundary is the international border of Nigeria and Chad, and Nigeria and Cameroon. The boundary to the west and south is the old strandline of the Lake Chad (visible on the ground by the colour of the soil). The strandline follows an irregular path extending from Bosso, at the 'mouth' of R. Yobe, on the border with Niger, southeastward through Kurnawa to Baga, and southwards to beyond the deltas of R. Ngadda and R. Yedseram.

The Lake Chad extended to this strandline as recently as 1965, but the lake has decreased considerably in size within the last four decades (Rekacewicz, 2002) due to adverse climatic variability and upstream river regulation in the Yobe and Ngadda catchments. Currently, the lake area in Nigeria has been reduced to disjoint wetlands separated by dunes, though it is believed that lake size is once again on the increase due to the more clement climate that prevailed in the last few years. There are also plans for inter-basin water transfer from the Central African region into the lake, to enhance lake water levels.

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

13°4'N 13°48'E (Latitude 13,07 and Longitude 13,80 in decimal degrees)

9. General location:

Include in which part of the country and which large administrative region(s) the site lies and the location of the nearest large town.

The wetlands are in the northeastern corner of Nigeria, extending from the border with the Republic of Niger, southeastwards to the tripartite border junction of Nigeria, Chad and Cameroon, and to just beyond the delta of R. Yedseram.

The wetlands lie entirely within Borno State (2006 population: 4,151,193). Maiduguri, the state capital (2006 population: 1,197,497) lies approximately 150 km to the southwest. There are a number of small towns (population < 20,000) along the western margins of the wetlands. These include Bosso, Kurnawa, Baga, Marte and Gamborou.

10. Elevation: (in metres: average and/or maximum & minimum)

280m.a.s.l

11. Area: (in hectares)

607353.67 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.

The wetlands are in the Sahel, on the southern fringe of the Sahara Desert in northeastern Nigeria. The site currently consists of disjoint marshy zones separated by dry land and dunes. Until the 1960s, Lake Chad submerged most of the wetlands, but lake waters receded leaving the current wetlands and the delta wetlands of R. Yobe, R. Ngadda and R. Yedseram.

Lake waters receded consequent upon adverse climatic variability and extreme droughts, and upstream dam construction and water abstraction schemes in the Yobe and Ngadda basins. Lake Chad's water level has begun to rise since 2001, and the wetlands may again become fully extensive.

Grasses, sedges, floating macrophytes, and shrubs cover the wetlands. *Typha australis*, *Cyperus papyrus* and floating macrophytes form islands harbouring wildlife. *Mimosa pigra* forms thick stands at the edges of the wetlands while *Acacia nilotica* and *Hyphaene thebaica* are found on raised locations. Lilies are on open water. Thickets of *Prosopis juliflora* and stands of *Salvadora persica* cover some of the former lake area after the water receded in the 1970s. Some parts of the wetlands are cultivated to rice. More crops are grown in the dry season (draw-down zone crops). Cattle graze uncultivated relatively dry areas. The wetlands are extremely important for water birds, especially wintering and passage Palearctic migrants. More than 300 bird species have been observed in the area. Eight (8) of these are new records for Nigeria (Gustafsson et al., 2003). Key species include the Ferruginous Pochard (*Aythya nyroca*), Pallid Harrier (*Circus macrourus*), Great Snipe (*Gallinago media*) and Stanley Bustard (*Neotis denhami*). Others include the Eastern Imperial Eagle (*Aquila heliaca*), Steppe Eagle (*Aquila nipalensis*), Peregrine Falcon (*Falco peregrinus pelegrinoides*) and Short-eared Owl (*Asio flammeus*). The Black-headed Gonolek (*Laniarius erythrogaster*) inhabits the *Prosopis juliflora* thickets. *C. macrourus*, *G. media*, *A. nipalensis* and *A. heliaca* winter in the area and are of global conservation concern. Hyenas (probably *Crocuta crocuta* whose global population is presumed to be declining) have been heard and seen by locals. No part of the area is protected. Fishing and hunting are widespread. Rice and wheat cultivation suffer heavy depredation from the Red-billed Quelea (*Quelea quelea*), Orange Bishop (*Euplectes franciscanus*), Yellow-crowned Bishop (*Euplectes afer*) and Weaver (*Ploceus* sp). The huge government sponsored irrigation scheme (South Chad Irrigation Project) in the area failed/collapsed when the lake waters on which it depended receded.

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:

This is a wetland representative of natural wetlands in the Sahel. It is one of three major wetlands located in the Sahel, namely, the Inland Delta of the R. Niger (SW of Timbuktoo in Mali), the Lake Chad wetlands, and the Sudd swamps in Sudan. The area surrounding the Lake Chad wetlands holds a number of species of the Sahel biome (see Ezealor, 2002, p18).

Criterion 2:

The wetlands support the Vulnerable Marbled Teal (*Marmaronetta augustirostris*). It also supports the Bannerman's weaver (*Ploecus bannermani*). These species are believed to be declining worldwide and have been declared as vulnerable species in Nigeria (Lepage, 2003, Birdlife International; Ezealor, 2002; Nigeria: National Biodiversity Strategy and Action Plan, 2002, p99-100). The area is also notable for the Kouri ox, a domesticated breed of *Bos taurus longifrons*, which is at the risk of extinction (WWF International Living Waters Programme, Lake Chad, 2003). The Kouri ox is well adapted to the semi-aquatic habitat of the wetlands around Lake Chad. However, changes in the landscape and in the rearing practices of local herders have led to an increase in crossbreeding between the Kouri and the local breeds of the Zebu.

Criterion 4:

The wetlands are extremely important for water birds, especially wintering and passage Palearctic migrants. More than 300 bird species have been observed in the area of which 8 are new records for Nigeria. It provides refuge to birds during winter in their home range e.g. *Circus macrourus* and *Gallinago media* winter in the area

Criterion 5:

They support a huge number of water birds, the wetlands being on a major bird migration route between Africa and the Palearctic. More than 300 species have been observed in the wetlands. 8 of these are new records for Nigeria (see Gustafsson et al., 2003). WWF Living Waters (2003, p2) notes that 'at least 70 species of birds make stopovers each year, especially Pintail (*Anas acuta*) – about half a million, Garganey (*Anas querquedula*) – about 400000, and Ruff (*Philomachus pugnax*) – about 130000'. It was further noted that these numbers are much lower than those reported in the 1960s.

Criterion 7:

The wetlands support indigenous fish species and populations that contribute to global biological diversity. They had a rich fish biodiversity, with known endemism. Ita (1993) reports that there were approximately 80 fish species in the wetlands, but since the 1972-73 drought, there has been a considerable reduction in the number of species. Bukar and Gubio (1985) report that there remains only 19 species. For instance, *Lates* sp. and *Gymnarchus* sp. have completely disappeared. The ancient lungfish (*Protopterus annectens*), which is unique to the wetlands and the region, has become vulnerable due to wetland long-term desiccation. The current dominant species are the *Clarias* sp. and the tilapias. Extant species include: *Alestes nurse*, *Bagrus bayad*, *Labeo senegalensis*, *Malapterurus electricus*, *Synodontis* sp., *Mormyrus* sp., *Hyperopisus bebe*, *Hydrocynus brevis*, *Tilapia zillii*, *Sarotherodon (T.) galilaeus*, *T. Oreochromis (T.) niloticus*, *Tilapia monodi*, and *Clarias lazera* (african catfish).

15. Biogeography (required when Criteria 1 and/or 3 and /or certain applications of Criterion 2 are applied to the designation):

a) biogeographic region:

Sahel

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:

Describe, as appropriate, the geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth, water permanence; fluctuations in water level; tidal variations; downstream area; general climate, etc.

The wetlands are in the northeastern corner of Nigeria, in the Lake Chad basin. They currently consist of disjoint marshy zones separated by dry land and dunes.

This portion of the Chad basin is part of a vast monotonous plain developed on Pleistocene sedimentary rocks of the Chad formation. The plain is tilted towards the Lake Chad with a very low gradient of 1:2500. The formation consists of a succession of clays, sandy clays and silts with some sand and gravel horizons. Thick (up to 100m) sandy drifts overlie the formation. In the wetlands as in many other parts of Chad basin, the clays of the Chad formation incorporate accumulations of organic matter. Such dark clays are referred to as *firki* or Black Cotton Soils. Where the clays are exposed at the surface, as in the wetlands, they become saturated during the rainy season and the area is converted into vast swamps.

Climate here is the Sahel type (Bshw). Annual rainfall is 300 mm with rainfall mainly occurring between June and September. The highest amounts occur between July and September. The dry season is from October to May, and is entirely rainless, with the exception of some years when there are early rains in May. Climate is highly variable and the area has experienced recurrent severe droughts between 1970 and present. The average temperature during the rainy season is 32⁰C. Temperature rises to 40⁰C in October and November just before the onset of the Harmattan. Average temperature during the Harmattan season (December – February), when the chilly dust-laden winds are strongest, is 8⁰C. This period is marked by the presence of huge amounts of dust in the air, a consequence of the low humidity, desiccation of the soils and the gusty winds that cause great dust storms. A result is the very poor visibility at this time of the year. April is the hottest month of the year, when maximum temperature attains 47⁰C. Wind erosion is particularly serious towards the end of the dry season when dust devils prevalent at this time and the storms preceding the onset of rains blow off much soil. The low humidity, high temperatures and strong winds promote high evapo-transpiration. Potential evaporation is estimated at >3000 mm annually.

R. Komadugu-Yobe, R. Ngadda and R. Yedseram are the main rivers providing inflow into the wetlands. Contribution from direct precipitation should be significant given the magnitude of the wetlands and the clayey soils. Flow into the wetlands start in August through local rains, but peaks between December and February. The late arrival of the floodwaters is due to the slow passage through the vast wetlands along the river courses and their deltas. Lake Chad wetlands attain their highest water levels in February. The wetlands drain into Lake Chad when there is continuity between the

wetlands and lake waters. Lake Chad's water level has begun to rise since 2001, and the wetlands may again become fully extensive.

17. Physical features of the catchment area:

Describe the surface area, general geology and geomorphological features, general soil types, and climate (including climate type).

The wetlands are in the eastern extremity of the part of the Lake Chad basin in Nigeria. The wetlands are contiguous with the Lake. The main rivers here are the Komadugu-Yobe, Ngadda and Yedseram. The Chad basin is a vast open plain developed on young sedimentary rocks of the Chad formation that consists mainly of clays with some sand and gravel horizons. Thick (up to 100 m) sandy drifts overlie the formation. Concretionary ironstone has been formed underneath the drift. In many places, the clays of the Chad formation incorporate accumulations of organic matter. Such dark clays are referred to as *firki* or Black Cotton Soils. Where the clays are exposed at the surface, they become saturated during the rainy season and the area is converted into swamps. For example, the Yedseram valley incorporates a 7 km wide flood plain. The wetlands of the Komadugu-Yobe are much larger and internationally known. Due to the magnitude of the floodplain wetlands and the very gentle gradient of the valleys, floodwaters do not arrive the lower reaches where the rivers debouch into the Lake Chad wetlands, until well into the dry season.

Annual rainfall varies from 300 mm in the north to over 1000 mm in the south of the Lake Chad basin, and the length of the rainy season from three to six months. The zones with annual rainfall of 300 mm have potential evapo-transpiration >3000 mm annually. The result is that high evaporation and low rainfall preclude the development of surface streams except where flash flows are generated during intense rainfall. The water balance in the driest and northernmost zones (Damasak, Geidam and Kukawa) is such that soil moisture deficits occur from October to July and soil moisture recharge occurs only during August and September. Water losses are due largely to evaporation in poorly drained flood plains and to infiltration into the upper zone aquifer of the Lake Chad basin.

Wind erosion is particularly serious towards the end of the dry season when the storms preceding the onset of the rainy season blow off much soil.

With the exception of what is in the Chad Basin National Park, and the nearby Sambisa Game Reserve, the vegetation has been severely modified as a result of several activities associated with human occupation. These include bush clearing and burning for cultivation and hunting as well as cattle grazing. Natural vegetation is almost completely absent, but several tree species have been planted for shade and fruit e.g. *Acacia albida*, *Tamarrind indica* and *Butyropermum parki*. Even the gallery forests that abounded in the area have since disappeared subsequent to the long drought that plagued the area between the 1970s and the 1990s, and through wood harvesting. The existing vegetation consists of shorter and more feathery grass studded with thorny plants, usually species of *Acacia*. An important natural species still existing in large numbers either singly or in dense groves is the Doum palm (*Hyphaene thebaica*).

18. Hydrological values:

Describe the functions and values of the wetland in groundwater recharge, flood control, sediment trapping, shoreline stabilization, etc.

The retention of water in the wetlands due to the very gentle gradient should promote infiltration into the upper zone aquifer of the Lake Chad basin. However, the clayey nature of the top horizons negatively impacts on the magnitude of the recharge from the wetland. The very gentle gradient of the wetland promotes flooding and sediment trapping rather than flood control. Floodwater retention ensures that floodwaters do not arrive Lake Chad until well into the dry season.

Ground water occurs in the area under water table conditions, in perched aquifers and as confined or semi-confined aquifers. The wetlands support fisheries, residual moisture cultivation and grazing.

19. Wetland Types

a) presence:

Circle or underline the applicable codes for the wetland types of the Ramsar "Classification System for Wetland Type" present in the Ramsar site. Descriptions of each wetland type code are provided in Annex I of the *Explanatory Notes & Guidelines*.

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

b) dominance:

Tp, P, N, O

20. General ecological features:

Provide further description, as appropriate, of the main habitats, vegetation types, plant and animal communities present in the Ramsar site, and the ecosystem services of the site and the benefits derived from them.

The wetlands are within the Sahel in northeastern Nigeria. Vegetation consists of grasses, sedges, floating macrophytes and small trees but in the vicinity of the wetlands, the favourable moisture conditions have promoted the growth of thickets.

Grasses, sedges and shrubs cover the wetlands. *Typha australis*, *Cyperus papyrus* and floating macrophytes form islands harbouring wildlife. *Mimosa pigra* forms thick stands at the edges of the wetlands while *Acacia nilotica* and *Hyphaene thebaica* are found on raised locations. Lilies are on open water. Thickets of *Prosopis juliflora* and stands of *Salvadora persica* cover some of the former lake area after the water receded in the 1970s. Some parts of the wetlands are cultivated to rice. Wild rice (*Oryza* sp.) grows in the wetlands and is harvested for food. More crops are grown in the dry season (draw-down zone crops). Cattle graze uncultivated relatively dry areas.

The wetlands are extremely important for water birds, especially wintering and passage Palearctic migrants. More than 300 bird species have been observed in the area of which 8 are new records for Nigeria. Key species include the Ferruginous Pochard (*Aythya nyroca*), Fulvous Tree duck (*Dendrocygna bicolor*), Egyptian Goose (*Alopochen aegyptiacus*), Pallid Harrier (*Circus macrourus*), Great Snipe (*Gallinago*

media), Stanley Bustard (*Neotis denhami*), Nubian Bustard (*Neotis nuba*), Eastern Imperial Eagle (*Aquila heliaca*), Steppe Eagle (*Aquila nipalensis*), Peregrine Falcon (*Falco peregrinus pelegrinoides*), Short-eared Owl (*Asio flammeus*), Black-headed Gonolek (*Laniarius erythrogaster*), Secretary Bird (*Sagittarius serpentarius*), River Prinia (*Prinia fluviatilis*), Rusty Lark (*Mirafraga rufa*), Garganey (*Anas querquedula*), Pintail (*Anas acuta*), Shoveler (*Anas clypeata*), Marabou Stork (*Leptoptilos crumeniferus*), Marbled Teal (*Marmaronetta augustirostris*), Ruff (*Philomachus pugnax*), Pink-backed Pelican (*Pelecanus rufescens*), Glossy ibis (*Plegadis falcinellus*) and African spoonbill (*Platalea alba*).

The wetlands had a rich fish biodiversity, with known endemism. Ita (1993) reports that there were approximately 80 fish species in the wetlands, but since the 1972-73 drought, there has been a considerable reduction in the number of species. Bukar and Gubio (1985) report that there remains only 19 species. *Lates* sp. and *Gymnarchus* sp. have completely disappeared. The ancient lungfish (*Protopterus annectens*), which is unique to the wetlands and the region, has become vulnerable due to wetland long-term desiccation. The current dominant species are the *Clarias* sp. and the tilapias. Extant species include: *Alestes nurse*, *Bagrus bayad*, *Labeo senegalensis*, *Malapterurus electricus*, *Synodontis* sp., *Mormyrus* sp., *Hyperopisus bebe*, *Hydrocyanus breris*, *Tilapia zillii*, *Sarotherodon (T.) galilaeus*, *Oreochromis (T.) niloticus*, *Tilapia monodi*, and *Clarias lazera*.

The Nile monitor (*Varanus niloticus*) abounds in the area but the Nile crocodile (*Crocodylus niloticus*) appears to have been hunted out. Cattle, goats and sheep have replaced wildlife.

The fish life supports the livelihoods (fishing, processing and marketing) of the local people and many from neighbouring countries. The fish from the wetlands and the lake are sold in markets all over Nigeria.

21. Noteworthy flora:

Typha australis, *Cyperus papyrus* and floating macrophytes form islands. *Mimosa pigra* forms thick stands at the edges of the wetlands while *Acacia nilotica* and *Hyphaene thebaica* are found on raised locations. Lilies are on open water. Thickets of *Prosopis juliflora* cover some of the former lake area after the water receded in the 1970s. Wild rice (*Oryza* sp.) grows in the wetlands. Non-indigenous flora includes *Azadirachta indica* (Neem) and *Eucalyptus* spp.

22. Noteworthy fauna:

Key species include the Ferruginous duck – *Aythya nyroca*, *Circus macrorus*, *Gallinago media* and *Neotis denhami*. Others include *Aquila heliaca*, *Aquila nipalensis*, *Falco (peregrinus) pelegrinoides* and *Asio flammeus*. *Laniarius erythrogaster* inhabits the *Prosopis juliflora* thickets. *C. macrorus* and *G. media* winter in the area and are of global conservation concern. Hyenas (probably *Crocuta crocuta* whose global population is presumed to be declining) have been heard and seen by locals.

Others are Charachin (*Alestes baremoze*), *A. dentex*, the cat fish known as mud cat (*Pylodictis olivaris*), *Tilapia*, *Clarias*, *Protopterus*, and *Synodontis*.

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 social values derive from fisheries, residual moisture farming, grazing and collection of wild resources.

The majority of the people living in the vicinity of the wetlands engage in one form of agricultural production or the other. Close to 60% are involved in arable farming and sizable proportions engage in livestock keeping and fishing. All of these activities generate large economic returns on which the livelihood of many is hinged. For example the annual fish catch in the Lake Chad area in the early seventies was between 130,000-141,000 tons. Present level of production is close to that of 1977 and is in the region of 60,000 to 85,000 tons. Of all the numerous fishes that inhabit the waters of the Chad basin, the cat fish known as mud cat (*Pylodictis olivaris*), which inhabits the wetlands has remained the most widely cropped. The basin in general, is agro-ecologically of a great significance in Africa. Table 1 shows gross productivity of the basin as reported by King (1993) in French currency CFA.

Table 1: Reports on gross agricultural productivity in the Chad Basin

Fisheries	26,325,000,000 FCFA
Flood recession agriculture (excluding Nigeria)	15, 513,413,000 FCFA
Livestock	8,589,045,134 FCFA
Small scale irrigation projects	6,250,894,000FCFA
Large scale irrigation projects	5,493,784,000 FCFA

Source: King, (1993)

Fishing activities are at their peak during the flood season, which extends from September to February. During the farming season, fishermen become farmers and farm the drawdown areas. Fishing communities are located around and on islands in the wetlands. Fishing is a mainstay of the local economy. Agriculture and pastoralism are the other key contributors. Fisheries provide employment, income and food. The fish trade supplies food to urban markets as far away as Lagos, and thus also generate secondary employment for fish sellers and transporters.

- 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 fishing, 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. Over-fishing, hunting, grazing and collection of wild resources have contributed to declining populations. This trend has been aggravated by climatic variability and the continuing diversion of potential inflow for irrigation and water supply.

24. Land tenure/ownership:

a) within the Ramsar site:

Though Federal and State Laws alienate the communities, the people operate as *de facto* owners of the wetlands and adjoining territory. The current land tenure in the area is a mixture of customary and institutional holding. Resident communities control all lands (subject to Federal/State intervention when the land is required by government). Each land component (arable land, pond, etc) is under the control of families, with this control depending on historical annexation and approval of the community leader.

b) in the surrounding area:

Federal Land Use law has provisions that enable government to dispossess families or individuals of such land if it is needed for public purpose, as in theory all land belong to the Federal/State Government. Similar tenure arrangements also apply to fishing rights in water bodies.

25. Current land (including water) use:

a) within the Ramsar site:

Fishing, agriculture, livestock grazing, and collection of wild resources.

b) in the surroundings/catchment:

Agriculture, livestock grazing and collection of wild resources

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:

Fishing and hunting are widespread. Recession of lake waters due to adverse climatic influence and upstream dam construction in the Yobe and Ngadda basins and the consequent continuing desiccation of the wetlands.

b) in the surrounding area:

Recession of lake waters due to adverse climatic influence and upstream dam construction. Uncontrolled harvesting of wild resources, over-grazing of pastures, bush burning, prevention of the regeneration of trees and compaction of soils by foraging domestic animals enhance desertification in the area. The most serious threat remains the lack of protection or a management programme for the wetlands.

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.

No part of the area is protected.

The only element of management in the area is the one provided by the Kanuri traditional rulers and 'owners', who preoccupy themselves with the sale of fishing rights in ponds and stretches of water, as well as farming rights on the receding lakebed. Federal Government institutions such as the Fresh Water Fisheries School, Baga, the Lake Chad Research Institute, Maiduguri, and the Chad Basin Development Authority, Maiduguri, focus on research and development work in the area, and have no management plans for maintaining the area's integrity.

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?:

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.

None

29. Current scientific research and facilities:

e.g., details of current research projects, including biodiversity monitoring; existence of a field research station, etc.

Various fisheries studies have been conducted on the lake. The Important Bird Area survey has been conducted in the area.

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

e.g. visitors' centre, observation hides and nature trails, information booklets, facilities for school visits, etc.

None

31. Current recreation and tourism:

State if the wetland is used for recreation/tourism; indicate type(s) and their frequency/intensity.

None

32. Jurisdiction:

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

Ministry of Agriculture and Natural Resources, Maiduguri, Borno State

Ministry of Environment, Maiduguri, Borno State

33. Management authority:

Permanent Secretary

Ministry of Agriculture, Maiduguri, Borno State

Permanent Secretary

Ministry of Environment, Maiduguri, Borno State

34. Bibliographical references:

Scientific/technical references only. If biogeographic regionalisation scheme applied (see 15 above), list full reference citation for the scheme.

- Bukar, T.A. and A.K. Gubio** (1985) The decline in commercially important species of fish and predominance of *Clarias lazera* in Lake Chad, p 35-41. In: E.O. Ita et al. (eds.) Proceedings, Fisheries Society of Nigeria (FISON).
- Ezealor, E.U.** (2002) Critical sites for biodiversity conservation in Nigeria
FAO. Managing Biodiversity in Lake Chad Basin. Biodiversity for food security.
FAO. 10p (ftp://ftp.fao.org/paia/biodiversity/biodiv_exhibition2_en.pdf)
- Gustafsson, R., C. Hjort, U. Ottosson and P. Hall** (2003) The Lake Chad bird migration project: Birds at Lake Chad and in the Sahel of NE Nigeria, 1997-2000. *Special Report from Ottenby Bird Observatory*. PI 1500. SE-380 65 Degerhamn, Sweden
- Ita, E.O.** (1993) Inland fishery resources of Nigeria. *CIFA Occasional Paper* No. 20. Rome, FAO. 120p
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- Nigeria: National Biodiversity Strategy and Action Plan** (2002) 104p (<http://www.cbd.int/doc/world/ng/ng-nbsap-01-en.pdf>)
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Please return to: **Ramsar Convention Secretariat, Rue Mauverney 28, CH-1196 Gland, Switzerland**

Telephone: +41 22 999 0170 • Fax: +41 22 999 0169 • e-mail: ramsar@ramsar.org