

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

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

Categories approved by Recommendation 4.7 (1990), as amended by Resolution VIII.13 of the 8th Conference of the Contracting Parties (2002) and Resolutions IX.1 Annex B, IX.6, IX.21 and IX. 22 of the 9th Conference of the Contracting Parties (2005).

Notes 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. Further information and guidance in support of Ramsar site designations are provided in the *Strategic Framework and guidelines for the future development of the List of Wetlands of International Importance* (Ramsar Wise Use Handbook 7, 2nd edition, as amended by COP9 Resolution IX.1 Annex B). A 3rd edition of the Handbook, incorporating these amendments, is in preparation and will be available in 2006.
3. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Secretariat. Compilers should provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of all maps.

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

1. MOHAMADOU Oumarou, Technical Assistant for Applied Ecology, CACID/Waza Logone, P.O. Box 284 Maroua. Tel.: +237 229 22 71; Cel.:+237 779 32 76

FOR OFFICE USE ONLY.

DD MM YY

--	--	--

Designation date

--	--	--	--	--	--	--	--

Site Reference Number

2. Tabe Ebanga-Orock TANJONG, WWF-Cameroon Programme Office, BP 6776, Yaounde Cameroon. Tel: +237 221 70 84 or +237 950 36 21 Fax. +237 21 70 85
ttanjong@wwfcarpo.org

2. Date this sheet was completed/updated:

04 August 2006

3. Country:

Republic of Cameroon

4. Name of the Ramsar site:

The precise name of the designated site in one of the three official languages (English, French or Spanish) of the Convention. Alternative names, including in local language(s), should be given in parentheses after the precise name.

The Waza Logone Floodplain

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:

a) Site boundary and area

The Ramsar site boundary and site area are unchanged:

or

If the site boundary has changed:

- i) the boundary has been delineated more accurately ; or
- ii) the boundary has been extended ; or
- iii) the boundary has been restricted**

and/or

If the site area has changed:

- i) the area has been measured more accurately ; or
- ii) the area has been extended ; or
- iii) the area has been reduced**

** **Important note:** If the boundary and/or area of the designated site is being restricted/reduced, the Contracting Party should have followed the procedures established by the Conference of the Parties in the Annex to COP9 Resolution IX.6 and provided a report in line with paragraph 28 of that Annex, prior to the submission of an updated RIS.

b) Describe briefly any major changes to the ecological character of the Ramsar site, including in the application of the Criteria, since the previous RIS for the site:

7. Map of site:

Refer to Annex III of the *Explanatory Note and Guidelines*, for detailed guidance on provision of suitable maps, including digital maps.

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:

e.g. the boundary is the same as an existing protected area (nature reserve, national park, etc.), or follows a catchment boundary, or follows a geopolitical boundary such as a local government jurisdiction, follows physical boundaries such as roads, follows the shoreline of a waterbody, etc.

This site is delineated by physical boundaries such as the shoreline of a water body. On its eastern side, there is a broad flooded band of about 25 km within the river Logone and Chari. This is the plain of the great Yaéré.

On the south-west, it is delineated by the Mandara hills body. The west boundary of the site is made up by the road linking Tildé to the National Waza park reserve. The north-east part of the site is delineated by the river Logone at the Logone level. (Benech, & al. 1982).

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

Provide the coordinates of the approximate centre of the site and/or the limits of the site. If the site is composed of more than one separate area, provide coordinates for each of these areas.

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

Provide justification for each Criterion in turn, clearly identifying to which Criterion the justification applies (see Annex II for guidance on acceptable forms of justification).

Criterion 2

The floodplain supports “endangered species”, such as *Loxodonta africana* (VU). The floodplain has as an important and unique characteristic two National Parks - The Waza National Park [1,700 Km²] and the Kalamaloue National Park (4.5 Km²), both known for their protection of the elephant. The entire floodplain is said to contain the highest elephant populations of the Soudano-sahelian region. The Waza National Park, home to a diverse collection of wildlife populations, is also the cradle for the protection of other important endangered species including the lion *Panthera leo* (VU), Leopard (*Panthera pardus*, CITES App. I) and Cheetah (*Acinonyx jubatus*, VU).

Criterion 3

A huge concentration of wildlife in the Floodplain is found in the Waza National Park and Biosphere Reserve. This important diversity of wildlife stretches from Avifauna (379 species) (Scholte, De Kort and Van Weerd, 1999), to at least 30 species of mammals. This site also possesses a great diversity of Ichthyofauna (179 species) represented by species found in the Nile basin, the Niger basin, the Volta basin, Lake Albert and the River Zaire; thus representative of the region (Benech, 1982).

Criterion 4

The Waza Logone Floodplain also “supports populations of animal species at a critical stage of their lifecycles and provides refuge during adverse conditions”. Some of the 104 species of birds inventoried in the floodplain are migrants from Europe and around the globe visiting the area for wintering. The Floodplain therefore provides refuge for these species during adverse conditions in their natural habitat.

The elephant was also never known to inhabit the Waza National Park, and their presence around the Park was recorded as from 1947 when the first group crossed the Logone River from Chad (Flizot, 1948). Subsequent migration from Chad and Nigeria, and natural growth has caused a major increase in the populations of elephants in the region for the past 50 years (Tchamba, 1996). Population movement of elephants carried out by satellite tracking provides interesting results as per their movement before and after the construction of the dam in 1979. Prior to the construction of the Dam, elephants in the Waza National Park consistently foraged in the floodplain of the Yares (Flizot, 1948). After the construction of the dam, the number of elephants migrating to the north decreased drastically, while the numbers migrating to the South increased radically. Those that stayed in the Park were found predominantly in the *Acacia seyal* scrublands during the dry season, and during the wet season dispersed more (Tchamba, 1996). The floodplain therefore became the favourite elephant habitat during the wet season for the resident population of the Park. Studies also point to the fact that during the wet season (when water is not a limiting factor), elephants resident in the Park show a certain preference for the floodplain (Tchamba, 1996). After the "pilot flooding" in 1994, several natural waterholes were filled with water during the whole dry season indicating the shift in habitat use of elephants.

Other wildlife mammals come from Nigeria and Chad and invade the flooded plain when there is reduction of water during the dry season in their habitat.

Criterion 5

Waza Logone is a particularly good example of a wetland of international importance because “it regularly supports more than 20,000 waterbirds”. An inventory carried out in 2001 puts the number of birds counted in the area at 321,757 distributed into 104 different species. Annual bird counts have been carried out in the Floodplain since 1993. The main birds counted are:

1. Knobill goose (*Sarkidiornis melanotos*)
2. Spurwinged goose (*Plectropterus gambensis*)
3. Egyptian goose (*Alopochen aegyptiacus*)
4. Gargany (*Anas querquedula*)

The Waza Logone Project set-up to manage the resources of the floodplain provided between 1993 and 1997 an extensive census of bird species present in the floodplain. Results are tabled as follows:

Species	1993	1995	1996	1997
Spurwinged goose	2,128	845	2928	5249
Knobill goose	230	623	681	1184
Egyptian goose	-	-	5	10
Gargany	121	735	6781	2035
White faced tree duck (<i>Dendrocygna viduata</i>)	7524	5784	5427	15317
Total	12103	7986	15817	23795

The results above show an increase of goose and ducks in 1996 and 1997, as compared with the census data of 1993. Population estimates of the Black African crowned crane (*Balearica pavonina*) also show interesting statistics: 1100 in 1993, 700 in 1994, 400 in 1995 and 1600 in 1997.

These figures point to the fact that the region is rich in birds. Need therefore arises for the floodplain to retain its ecological character if it is to remain an important bird habitat.

NB. More recent data about the Avifauna of the region are being investigated. Once the results are out, this table will be actualized.

Criterion 6

The average biogeographic populations of the Spurwinged goose (*Plectropterus gambensis*) and of the White-faced tree duck (*Dendrocygna viduata*) exceed the 1% level, as shown by the counts taken in 1993, 1995, 1996 and 1997 (average of 2,788 birds, i.e. 2.79% and

average of 8,513, i.e. 2.24% respectively). The average biogeographic population estimates of the Black African crowned crane (*Balearica pavonina*) also exceed the 1% level, as shown by counts undertaken in 1993, 1994, 1995 and 1997 (it is not clear to which biogeographic population the birds found at this site belong to, but the 1% level is significantly exceeded for either of the two: 6.3% for *B. pavonina pavonina* and 2.4% for *B. pavonina ceciliae*).

Criterion 7

The importance of the Waza Logone is shown by its ichthyofauna with more than 179 species reported (Benech & al., 1982). Among these species, 106 (59 %) also exist in the Niger basin, 85 (47 %) in the Nile basin and 47 (26 %) in the river Zaire: thus its importance as a bank of biodiversity. Despite the fact that only 84 species are found within the very Lake Chad, this site possesses 25 endemic species with a single one (*Alestes dageti*) present in the very lake.

Criterion 8

This zone serves as a transit milieu to many fish species during the rainy season when they cross the site to the Lake Chad for spawning. Thus this site is vital for them and the construction of irrigation tanks is therefore a constraint to the ecological rule of this zone as it reduces the water supply of the area.

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

Name the relevant biogeographic region that includes the Ramsar site, and identify the biogeographic regionalisation system that has been applied.

a) biogeographic region:

The Waza Logone site falls within the soudanean biogeographic region.

b) biogeographic regionalisation scheme (include reference citation):

This biogeographical classification is based on the Ichthyofauna repartition in Africa. (Benech et al., 1982).

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 physical features of the Waza Logone Floodplain can better be understood if viewed from the wider context of the Lake Chad Basin complex. The Lake Chad Basin is situated between the Air mountains of Niger, the Tibetsi mountains and the Ennedi plateaus of Chad, the Darfur area in Sudan, and the northern edge of the Congo Basin in Central African Republic and Cameroon. The southern half of the basin which encompasses the Waza Logone Floodplain consists of extended swamps along two major river systems draining into Lake Chad: the Komadugu Yobe in Nigeria, and the Chari in Chad. About 95% of the inflow to Lake Chad originates from the Chari-Logone catchment and the rest from the Mandara hills seasonal rivers.

The Floodplain has a sudano-sahelian type of climate characterized by a long dry season (7 months) and a short rainy season. Annual rainfall stands at 750mm. The rainy season extends into the period of cooler weather due mainly to the southward passage of the inter-tropical convergence zone. The mean monthly temperature is about 27.6°C with maximum and minimum monthly means at 34.9°C and 20.2°C respectively.

The hydrological network of the region is tributary to the Logone River and the Mandara Mountains' naturally low slope that enables water to flow toward the plain. The El Beid River drains its waters into Lake Chad, thus serving as a natural outlet for the waters.

The great part of this area is covered by fluvio-lacustrine deposits from the quaternary made up of black hydromorphic clay and vertisols.

a) Flooding features

Two existing tendencies have been observed in the seasonal flooding of the floodplain by the Logone River. The first is rain-induced and the second flood-prompted. The second is mainly as a result of over-bank flooding of the main rivers. Rain provides a main contribution to inundation in the south of the floodplain where rain is higher, while in the north where rainfall is lower, over-bank flooding is predominant. The annual over-bank flooding reduces both peak flows and total volume of water in the Logone River. The floodplain therefore regulates the river by occasioning flows throughout the year and contributing return flows during the recession.

b) Flooding volume, extent and depth

The duration of the floodwater exceeding the bank at full capacity and the magnitude of the flood peak on the Logone River determines the volume of water in the lower Logone floodplain (Mott Macdonald, 1999). Rainfall in the Lake Chad basin varies, thus the duration, depth, extent and volume of flooding in the floodplain varies from year to year. The inundation in the Waza Logone floodplain extends from August to December in wet years, and duration, depth and extent of flooding is much lower during dry years. The extent and duration in the lower Logone floodplain is closely related to the peak flow and volume of floodwater through the Lai area.

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 catchment area of the Waza Logone site is mainly constituted by elevated lands among which the famous Mandara hills (1200 m). A great region around the site is the left Logone bank in which villages of fishers and herders are established.

The soils here are mainly sandy alluvium and vertisols.

The climate is sudano-sahelian type of climate characterized by a long dry season (7 months) and a short rainy season. Annual rainfall stands at 750mm. The rainy season extends into the period of cooler weather due mainly to the southward passage of the inter-tropical convergence zone. The mean monthly temperature is about 27.6°C with maximum and minimum monthly means at 34.9°C and 20.2°C respectively.

18. Hydrological values:

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

The Waza Logone floodplain plays a very important role in the filling of groundwater of the sudano-sahelian region, which is very arid. Waters of the floodplain function like a watershed for Lake Chad, which may disappear due to silting. In spite of all reflooding work undertaken by IUCN and the State of Cameroon, the presence of the Maga dam still has negative influence on the water level of the floodplain. However, programs are being studied for large-

scale reflooding options so that the multiple natural freshwater species present in the region should survive and the living conditions of the population should improve.

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*.

Marine/coastal: A • B • C • D • E • F • G • H • I • J • K • Zk(a)

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

Human-made: 1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9 • Zk(c)

b) dominance:

List the wetland types identified in a) above in order of their dominance (by area) in the Ramsar site, starting with the wetland type with the largest area.

As the Waza Logone site is a continuum to the great Lake Chad, the importance of the site is mainly with respect to this Lake. The Cameroonian part of this ecoregion is mainly dominated by:

Sp: Permanent alkaline marshes/pools.

M: Permanent rivers/streams/creeks; includes waterfalls.

N: Seasonal/intermittent/irregular rivers/streams/creeks.

Ss: Seasonal/intermittent saline/brackish/alkaline marshes/pools

Tp: Permanent freshwater marshes/pools; ponds, marshes and swamps on inorganic soils; with emergent vegetation water-logged for at least most of the growing season.

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.

Situated in the Lake Chad Basin, the floodplain is characterized by sudano-sahelian vegetation. It is dominated by herbaceous steppe formations (57.5%) where perennial species such as *Echinochloa stagnina*, *Hyparrhenia rufa*, *Oryza barthi*, etc are found. Woody formations represent 42.5% of the surface area covered by plants. The main woody species found include: *Acacia seyal*, *Acacia sieberiana*, *Balanites aegyptiaca*, *Ziziphus mauritiana*, etc. Aquatic species such as *Utricularia* spp are also visible. Besides, projects of plant restoration have been carried out at a small scale, with limited success. Several species have been planted, the main species being *Eucalyptus* sp. The choice of this species, because of its high transpiration rate may be one of the causes of the decrease of the water level in the site, and thus in Lake Chad.

The Waza Logone floodplain is habitat for several animal species. It is home to the Waza National Park (1,700 Km²) which is a biosphere reserve, as well as the Kalamaloue National Park (4.5 Km²). The last inventory came up with more than 20 animal species amongst which are 9,548 buffaloes (*Syncerus* spp), 1,140 elephants (*Loxodonta* spp.), 4,284 damalics, 989 giraffes (*Giraffa camelopardalis*), 64 lions (*Panthera leo*), etc.

Fish species fall under two groups: transhumance fishes that move from Lake Chad to the floodplain, depending on the depth of the waters during their reproduction period and those that remain permanently in the deep part of the river.

There are a variety of waterfowls. A 2001 inventory puts them at a total of 321,757 birds counted on both the Cameroonian and Chadian sides. Some of these species are migrants from Europe for wintering. The Waza Logone floodplain is a favourite place for migratory birds from around the globe.

21. Noteworthy flora:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 14, Justification for the application of the Criteria) indicating, e.g., which species/communities are unique, rare, endangered or biogeographically important, etc. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Plant species of the region are all important because of the threat they face mainly as a result of the destruction of their habitat. The Waza National Park, because of the protection it benefits from its legal status, has its flora preserved. Herbaceous species are found in the lower plains and depressions.

The main species of flora include *Balanites aegyptiaca*, *Acacia seyal*, *Acacia sieberiana* and *Ziziphus mauritiana*.

In the region, weeds are generally considered according to their life cycle. There are perennial species and annual species. Perennial species are threatened by the scarcity of floodwater due to climatic problems but more especially because of the construction of the Maga dam in 1979. The reflooding program executed by IUCN and the Government of Cameroon is gradually reversing this situation. Perennial species are found in the lower plains while the upper plains are host to a variety of all species. The main perennial herbaceous plants found are *Echinochloa stagnina*, *E. pyramidalis*, *Vetiveria nigriflora*, *Hyparrhenia rufa*, etc

All of these plants make of the floodplain an excellent center for animal grazing during the dry season.

The most important annual herbaceous species include *Sorghum arundinaceum*, *Corchorus* sp, *Cyperus* sp, etc.

22. Noteworthy fauna:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 12, Justification for the application of the Criteria) indicating, e.g., which species/communities are unique, rare, endangered or biogeographically important, etc., including count data. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

A huge concentration of wildlife in the Floodplain is found in the Waza National Park and Biosphere Reserve. This important diversity of wildlife stretches from Avifauna (379 species) (Scholte, De Kort and Van Weerd, 1999), to at least 30 species of mammals. There are other animals in the Waza and Kalamaloue National Parks.

An inventory of large animals revealed the following species:

Ostrich (*Struthio camelus*), Baboon (*Papio cynocephalus urcinus*), Common jackal (*Canis mesomelas*), Buffalo cob (*Syncerus caffer*), Hippopotamus amphibius, Reed cob (*Kobus kob kob*), Defassa cob (*Kobus ellipsiprymnus defassa*), Damalics (Sassaby- *Damaliscus lunatus*), Elephant (*Loxodonta africana*), Gazelle (*Gazella rufifrons*), Giraffe (*Giraffa camelopardalis*), Dotted hyena (*Crocuta crocuta*), Lion (*Panthera leo*), Arab bustard (*Chlamydotis undulata*)

undulata), Patas (*Erythrocebus patas*), Warthog (*Phacochoerus africanus*), Naine bustard (*Eupodotis ruficrista*).

The importance of some of these mammals is as follows:

Damalics (more than 4,000 heads), elephants (more than 1,000 heads) and giraffe (more than 900 heads) are the dominant species in terms of numbers in the Waza Park. The Reedbuck (*Redunca redunca*), Grimm's Duiker (*Sylvicapra grimmia*) are becoming locally extinct and now join the list of other species that are threatened over the last decades: Leopard (*Panthera pardus*), Cheetah (*Acinonyx jubatus*), Waterbuck (*Kobus ellipsiprymnus*), bushbuck (*Tragelaphus scriptus*) and the Red flanked Duiker (*Cephalophus rufilatus*).

A wide variety of birds also exist in the Waza Logone Floodplain, for details on species please see Annex I.

The diversity of fish species is wide (179) and includes *Tilapia* spp, *Clarius* spp, *Petrocephalus simus*, *Bagrus* spp, *Polypterus* spp, *Labeo* spp, *Alestes* spp, *Citharinus* spp, *Synodontis* spp, *Tetraodon* spp, etc.

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:

Social, cultural and economic activities in the floodplain are based and dependent on the functions, products and attributes of the floodplain. Activities follow each other as the resources are available according to the hydrological cycle. Use of the products and attributes of the floodplain is distributed in ethnic lines, for each ethnic group has a common language and shared history, which forms their collective identity (Van Driel, 2002). Pastoralists (the Choa Arabs, Fulani, and some semi-nomadic Fulbe groups) use the seasonally inundated floodplains in the dry season because grass production continues there for a long time. When the floodplains become inundated, the pastoralists take their herd to higher grounds for fear of water borne diseases, leaving the inundated areas for extensive fishing by fishermen (the Kotoko and Musgum). Agriculturists grow their crops during the rainy season, and those that live in the floodplain can extend the cropping season by growing floating rice in the floodwater that follows the rains.

The floodplain is a source of livelihood and sustenance for more than one hundred thousand people who live in and around the area. Fishing and pastoralism are of significant importance and contribute to the entirety of the activities of the people of the area. It is not only of national, but also of immense international significance. The rich pastures created by the receding floods of the plain in the dry season are responsible for the large number of livestock belonging to nomadic and transhumant herdsman from Chad, Nigeria and Cameroon.

Most tourists that visit the Floodplain prefer the Waza National Park and Biosphere Reserve where there is a high concentration of exotic animals and birds. Tourists are attracted by the landscape, the herbivores such as elephants, the giraffe and various antelope species, predators and birds. The number of tourists visiting the Park has dropped from more than 7000 in 1984 to 5400 in 1997. Depreciation in tourist's facilities, financial and economic problems faced by the tourism industry is the prime reason for this drop.

The abundant amount of fish in the floodplain has made it an important center for fish production in the North of Cameroon, Chad and Nigeria. 5% of the local population carries out all the fishing in the floodplain and most of the fishing is carried out throughout the year. The fertile soils of the floodplains permit sedentary agriculture. In June, fields are ploughed and sowed with red and white Millet, maize and vegetables. Roof thatching, Arabic gum collection and handicrafts are other predominant activities that emanate from the floodplain.

Grazing and fishing in the Waza National Park and Biosphere Reserve has resulted in serious conflicts between Park authorities and pastoralists and fishermen. Both prefer to fish and graze in the National Park (which is a no go area under Cameroon Law) because pastures are abundant, water is available in the water holes, and there is sufficient fish in the ponds of the Park.

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:

- i) sites which provide a model of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland:
- ii) sites which have exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland:
- iii) sites where the ecological character of the wetland depends on the interaction with local communities or indigenous peoples:
- iv) sites where relevant non-material values such as sacred sites are present and their existence is strongly linked with the maintenance of the ecological character of the wetland:

No

24. Land tenure/ownership:

a) within the Ramsar site:

The Waza Logone Floodplain falls within a complex of different categories of management. It is composed of 2 National Parks (Waza National Park and the Kalamaloue National Park), which are areas protected for wildlife under the permanent forest estate. Like all other categories of management that fall under state forests, they are the private property of the state. Other zones of the floodplain are categorised as agro-industrial zones while the rest are communal lands. As is the case with all land in Cameroon, the Waza Logone Floodplain belongs to the Government of Cameroon who may classify it for use in a manner it deems fit (Land Ordinances of 1974).

b) in the surrounding area:

The land tenure around the site is Private

25. Current land (including water) use:

a) within the Ramsar site:

The main land uses in the floodplain are small-scale agriculture, pastoralism, fisheries and the establishment of protected areas to conserve wildlife.

Subsistence farming is extensive and is based on “slash and burn” shifting cultivation methods. Major crops planted include *Sorghum bicolor* (Sorghum), *Pennisetum typhoides*, *Arachis hypogea* (peanuts), *Zea mays* (corn, maize), *Vigna unguiculata* (niébé, cow pea), and vegetables. Cotton is the main industrial crop. Net incomes deriving from agriculture for households in the area range from 30 to 340 Euro per household. The average investment per household is estimated at 36 Euro (Kuokam et al, 1996).

Fishing is also predominant in the area, except in the National Parks where special arrangements with the management authorities of the parks provide access to fishing under certain conditions. The favorite species fished is the *Calriacs anguillaris* which is considered as the tastiest and thus the most expensive. Figures from 1996/1997 fishing season point to an estimated figure of 12,000 Tons of fish harvested in the Waza Logone Project area (2600Km²) which gives a yield of about 46 Kg of fresh fish per ha (Kuokam et al, 1997).

The National Parks within the area are reserved solely for the conservation of wildlife. The Waza National Park was designated a United Nations Biosphere Reserve.

The floodplain also provides the necessary setting for pastoralism, for the marketing of livestock and for production and sale of milk. About 300 cows are sold every week in the floodplain, supplying the markets of Bogo, Maroua, and Banki in Nigeria. The daily average production of milk from the cows grazing in the area is 2.5 liters a day for a period of 6 to 20 months. The population density of the area is not high enough to enable consumption of this milk and storage facilities are limited and unsophisticated. Businessmen from Maroua come along to buy milk from the towns of Guivirdig and Pouss (Moritz, Scholte and Kari, 2002).

b) in the surroundings/catchment:

The catchment's area of Waza Logone is densely inhabited. Traditionally, intensive fishing was carried out in the floodplain, pasture in the surroundings and agriculture during the dry season, with sorghum being the main crop. Since 1982, irrigation projects have been set up for the culture of rice. Nowadays, this culture is still going on associated to that of cotton. Also the construction of an irrigation tank at the left bank of the Logone from Yagoua to Tekele has reduced the size of the flooded fields.

The few elevated lands around the site are occupied by fisher and herder's villages which are flooded during the rainy season.

The emerged lands near these villages are planted with sorghum.

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 Floodplain has been victim to serious economic and environmental decline for the past 2 decades. Poor rainfall and the construction of the Maga Dam have had a serious negative impact on the ecological character of the floodplain. The construction of the dam to feed the SEMRY rice scheme led to the disruption of the annual hydrological regime (Tchamba 1996). As a consequence, inundation was disrupted and the flooded areas equally reduced considerably. The floodplain was thus desiccated and forage reduced for both cattle and wildlife. The setting up of smaller irrigation schemes in the Mandara Mountains to the south-east of the floodplains also had a negative effect on the depth of the water table. The areas that have been seriously affected by these phenomena are the entire eastern part of the Waza

National Park and Biosphere Reserve and downstream beyond the Maga Dam itself. The effect of decreasing rainfall, the Maga dam construction and the other irrigation schemes around the Mandara Mountains can be summarised as follows:

- a. Reduced flooding over a large portion of the floodplain
- b. Shortage of surface water during the dry season
- c. Drastic reduction in grass for grazing of herds, and a collapse in fishing potential.
- d. Mass emigration of resident farmers, herders and fishermen
- e. A serious decline in the biodiversity of the floodplain especially in the Waza National Park and Biosphere Reserve.
- f. Traditional fishermen have moved professions and are cultivating dry season millet (mouskouari) and some nomads have now become sedentary in order to cut and sell fuelwood.

In addition encroachment on the Park renders fragile the health of the wildlife in the Park and counteracts efforts to preserve the biodiversity of fish species in the Park.

Lack of respect of fishing seasons (periods) imposed by the law, and the use of fishing materials with dimensions prohibited are some of the unsustainable habits of fishermen that may in the long-term have a deleterious effect on the fish biodiversity of the Floodplain.

b) in the surrounding area:

The planting of eucalyptus trees in order to supply the local population with firewood may lead to the reduction of the water level in the site because of the high transpiration rate of this tree.

Grazing activity of cattle on the elevated lands around the region may cause a faecal pollution of the site although it is not severe.

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.

Two protected areas are found within the site. They are:

The Waza national park created in 1968 with an area of 170 000 ha and that of The Kalamaloue created in the same year with an area of 4 500 ha.

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?:

The problems of the Waza Logone Floodplain have for the past decade received the kind of international attention the site deserves. This concern has during this period spurred the institution of certain conservation initiatives to reverse the problems faced by the floodplain. Spearheaded by the Government of Cameroon with technical and financial assistance from

the Government of the Netherlands, WWF, SNV and the Centre for Environmental Science (CML) at the University of Leiden, the Waza Logone Floodplain Restoration Project commenced in 1988.

Phase 1 of the project commenced in 1988 and consisted of a study to define the issues and set out objectives for a rehabilitation programme for the floodplain. Phase 2 of the project commenced in 1992 with the objective of pursuing the integrated management of the resources of the floodplain, providing a sustainable livelihood for the people of the floodplain, and maintaining biodiversity. Phase 3 of the project commenced in 1995 and ended in 2000. It had as specific objectives:

- To restore the natural resources of the area by hydrological and ecological rehabilitation of the floodplain.
- To safeguard the National Parks of Kalamaloue and Waza Logone as important centres for global biodiversity.
- To develop and maintain systems of resource management which sustain the biodiversity of each of the sub-zones and buffer zones of the region, whilst ensuring the socio-economic development of the resident and migrant populations which depend on it.
- To ensure the capacity of the government and the local populations to maintain sustainable resource management and development in the long term
- To develop a community-level eco-development

The pilot releases (re-flooding) of 1994 and 1997 were highly successful and resulted in over 300km² of inundation of the plain not previously inundated before 1979. The effect of the pilot releases coupled with sudden increases in rainfall has been an increase in fish production of the floodplain. A doubling of nomadic and transhumant livestock numbers was projected to occur five years after the pilot scheme, and recent statistics point to fact that this target shall be met. The main results of this phase are summarized as follows:

a) Hydrological Studies and Pilot Release of water

Hydrological studies were carried out and analysis of the results provided a range of options for enhancing the volume of floodwater, which reaches the floodplain. An option was the implementation of a limited re-flooding scheme. A pilot release was carried out in 1994 after an intensive discussion with villages to be affected.

A five-year management plan was also developed for the Waza National Park and its peripheral zones through a process that involved the informed participation of local communities, and implementation of the management plan has since commenced.

The exit phase of the project was programmed to commence in 2000 and to end in 2003. It was expected to entail the large scale re-flooding of the area, and the transfer of responsibilities of the project to existing committees and new management organisations. Funding constraints have marred the implementation of these activities (especially the large-scale re-flooding component). Activities that are being carried out at this moment include environmental education programmes and some socio-economic activities.

d) Describe any other current management practices:

No other current management practices are being observed in the site.

28. Conservation measures proposed but not yet implemented:

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

If conservation and sustainable use gains made in Phases one and two of the project are to be capitalised on, it is absolutely necessary that Phase 3 of the project be implemented in its entirety. An objective that was central to Phase 3 of the project was the hydrological and ecological rehabilitation of the floodplain. This was to involve the restoration as far as is practicable of the physical conditions on the floodplain that existed before the construction of the Maga Dam. Proposed major re-flooding options was to further increase the area of inundation by at least a further 1750 km², in combination with an improvement in the quality of the flood over a greater area. Of this area, approximately 380 km² will be in the Waza National Park and Biosphere Reserve. These objectives have unfortunately not been met due to funding constraints. Actually, reflection is being done by the Government to find out a budget for the continuation of this conservation project.

29. Current scientific research and facilities:

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

The floodplain provides the necessary setting for scientific research. Research programmes are being carried out in the 2 National Parks of the floodplain. Focus of research in the area is on ornithological monitoring. University institutions carrying out research in the area include the University of Dschang, the Garoua Wildlife School, the University of Yaounde (all in Cameroon), and the University of Leiden (Holland). Research facilities in the area are minimal, though CACID/Waza Logone, has put in place certain facilities for basic research. The CACID/Waza Project has also put into place a data bank on scientific information on the region, and the manpower to run it. Studies on elephants are also intensive in the National Park. Elephant tagging and satellite surveillance is being carried out in the area by WWF, with objective to collect data on elephant movement and behaviour. Research on elephant animal conflicts is being carried out too.

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.

Conservation education activities on the ground are being carried out as planned under the 3rd Phase of the Waza Logone Project by IUCN/CACID Waza Logone Project. The objective is to raise the awareness of the local population

31. Current recreation and tourism:

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

The major tourist attraction in the floodplain is the Waza National park and Biosphere Reserve. The rich fauna and the beautiful landscape have attracted thousands of tourists every year, though as the results below show, numbers are in a downslide.

Number of tourists visiting the Waza National Park and Biosphere Reserve (Source: Chief Game Warden)

Year	Pre 1994	87/88	88/89	89/90	90/91	94/95	95/96	96/97
Number	7000	5600	5400	5700	5600	4500	5000	5400

The long term target set by Park management is 12,000 a year. The figures above point to the fact that the down slope actually commenced with the advent of the economic crisis in Cameroon. The economic crisis brought with it a drastic reduction of Government expenditure in tourism, and consequently depreciation in the tourist infrastructure available and the quality of services provided in and around the Park.

The elephant is the number one attraction of the Park, followed by the Lion. Elephants tend to stay longer in the Park due to the re-flooding schemes (Tchamba, 1996), giving added value to the touristic value of the Park. Of the tourists who visit the Park, 15% are nationals, 25% residents and 16% non-residents. The average length of stay in the Park is 3 days.

Facilities in the Park are average. There is a "Centre d'Accueil" or visitors lodge with basic amenities which is located at the entrance to the Park, and managed by the local community. There is also a Government run hotel in the environs of the Park with more adequate facilities.

32. Jurisdiction:

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

Territorial Jurisdiction: The Ministry of the Environment and Forestry (MINEF), Yaounde, Cameroon

Functional Jurisdiction: The Directorate of Wildlife and Protected Areas (DFAP), MINEF, Yaounde, Republic of Cameroon

33. Management authority:

Provide the name and address of the local office(s) of the agency(ies) or organisation(s) directly responsible for managing the wetland. Wherever possible provide also the title and/or name of the person or persons in this office with responsibility for the wetland.

Provincial Delegation of the Environment and Protection of Nature of the Far North Province, Maroua (Cameroon).

NB. This address is complete

34. Bibliographical references:

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

Benech V., Quensiere J. et Vidy G. 1982 Hydrologie et physico-chimie des eaux de la plaine d'inondation du Nord-Cameroun. Cah.ORSTOM, sér. Hydrol.,vol. XIX, N° 1 pp. 15-35.

Hughes R. H. et Hughes J. S. 1992. Répertoire des zones humides d'Afrique. UICN, 808p.

Loth, Paul (Editor) (2002). "Floodplain Rehabilitation in Cameroon: The Case of the Waza Logone Project." IUCN; Centre for Environmental Science

Kouokam, R(1996). "Synthese et Analyse des Resultats des Etudes Comparatives des Situations Socio-economiques des Villages de la Zone Pilote du Projet Waza Logone Campagne 1994/95 1995/96." PWL, Maroua; IUCN

DHV Consulting Engineers, *et al* (1979). "Lake Chad Basin Development Study Intermediate Report" Environmental Biology of Fishes 22: 155-160.

Tchamba, M (1996). "Elephant Human Conflicts in North Cameroon". PhD Thesis, Utrecht University, The Netherlands

IUCN and MINEF (1998). "Rehabilitation of the Waza Logone Floodplain, Republic of Cameroon." Financing Proposal for the Reinundation Programme.

Scholte, P *et al* (1995) "Floodplain Rehabilitation in North Cameroon: Expected Impact on Vegetation, Pastoralists and Wildlife". Paper presented at the 5th International Rangeland Congress, Salt Lake City, Utah, USA

Noupa, P(1995) Etude des Interactions Ecologiques entre Herbivores Sauvages et Domestiques dans l'Ecosystème de la Plaine de Waza, Cameroun. Mémoire de Maîtrise; Université de Liège

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

Annex I

Birds of Waza Logone Floodplain

Tachybaptus ruficollis

Pelecanus onocrotalus

Pelecanus rufescens

Phalacrocorax africanus

Ardea cinerea

Ardea melanocephala

Ardea purpurea

Egretta alba

Egretta ardesiaca

Egretta intermedia

Egretta garzetta

Bubulcus ibis

Ardeola umbretta/ Scopus umbretta

Mycteria ibis

Anastomus lamelligerus

Ciconia episcopus

Ciconia ciconia

Ephippiorhynchus senegalensis

Leptoptilos crumeniferus

Threskiornis aethiopicus

Bostrychia hagedash

Plegadis falcinellus

Platalea alba

Dendrocygna bicolor

Dendrocygna viduata

Plectropterus gambensis

Sarkidiornis melanota
Nettapus auritus
Anas acuta
Anas hottentota
Anas querquedula
Pandion haliaetus
Haliaetus vocifer
Circus aeruginosus
Circus macrourus
Circus pyrgus
Lophaetus occipitalis
Balearica pavonina
Amaurornis flavirostris
Porphyrio porphyrio
Gallinula chloropus
Gallinula angulata
Otis arabs
Lissotis melanogaster
Microparra capensis
Actophilornis africana
Rostratula benghalensis
Himantopus himantopus
Burhinus senegalensis
Pluvianus aegyptius
Cursorius cursor
Glareola tectus
Vanellus senegallus
Charadrius hiaticula
Charadrius dubius
Charadrius pecuarius
Charadrius alexandrinus
Lymnocyptes minimus
Tringa ochropus
Gallinago gallinago
Limosa limosa
Tringa erythropus
Tringa tetanus
Tringa stagnatilis
Tringa nebularia
Tringa glareola
Actitis hypoleucos
Calidris minuta
Calidris temminckii
Philomachus pugnax
Larus fuscus
Larus cirrocephalus
Larus ridibundus
Gelochelidon nilotica

Chlidonias leucopterus

Chlidonias hybridus

Ceyx picta

Alcedo cristata

Ceryle rudis