



***Productive Sector Growth and Environment Division  
Office of Sustainable Development  
Bureau for Africa  
U.S. Agency for International Development***

**Considerations of Wildlife Resources  
and Land Use in Chad**

**James O. Keith  
Darrel C. H. Plowes  
Environmental Consultants**

**SD Technical Paper No. 45  
March 1997**



***Productive Sector Growth and Environment Division  
Office of Sustainable Development  
Bureau for Africa  
U.S. Agency for International Development***

## **Considerations of Wildlife Resources and Land Use in Chad**

**James O. Keith  
Darrel C. H. Plowes  
Environmental Consultants**

**March 1997**

Publication services provided by **AMEX International, Inc.**

Pursuant to the following USAID contract:

Project Title:	Policy, Analysis, Research, and Technical Support Project
Project Number:	698-0478
Contract Number:	AOT-0678-C-00-6066-00



# Introduction

Chad is one of the larger countries in Africa. It extends from the arid Sahara desert (24° N lat.) to the large rivers and equatorial forests of the south (8° N lat.). The variety of habitats existing in this spectrum of climatic conditions originally supported a richness and diversity of birds, large mammals, and other vertebrates that was comparable to the fauna of eastern and southern Africa. In the last several decades, however, Chadians have seriously depleted their fish and wildlife resources and have greatly reduced the ability of their environment to support wild animals.

Chad has suffered from either civil strife, drought, or famine almost continually since gaining independence from France in 1960. The growing human population has expanded the area used for agriculture and has increased numbers of both resident and transhumant livestock grazing on rangelands. This intensity of land use has reduced the quantity and the quality of habitats for wildlife despite remedial efforts (Depierre and Gillet 1971). The opening of boreholes, which enabled former nomadic people and their herds to remain continuously in areas that previously were only grazed for relatively short periods, has also had an adverse impact on wild ungulates in drier sites (Newby 1980). Periodic drought throughout the 1970s and 1980s, in addition to civil wars, depressed cotton prices in 1985, and invasions of desert locusts (*Schistocerca gregaria*) between 1986 and 1988 exacerbated the deteriorating conditions for peasant farmers.

The herds of wild ungulates, the larger birds such as ostriches and bustards, and the abundant

fish resources were heavily utilized to supplement crops during periods of food scarcity. As elsewhere in Africa, guns, ammunitions, and vehicles acquired for combat between rival forces provided mechanisms for harvesting wildlife at a scale not previously possible (Newby 1980). Demand for food and wanton killing of game resulted in severe reductions in many animal populations. Thomassey and Newby (1990) reported that elephant (*Loxodonta africana*) and black rhinoceros (*Diceros bicornis*) were severely harvested during this period and that an outbreak of rinderpest in 1982 and 1983 seriously reduced populations of buffalo (*Syncerus cafer*) and giant eland (*Taurotragus derbianus*).

Yet the fish and wildlife resources in Chad today still are sufficient, if used properly, to create incentives for local villages to protect and manage remaining populations. Villagers have learned that over-harvest and habitat destruction can greatly reduce fish and wildlife populations of value to them, and they realize that those resources will be lost unless they are afforded protection and properly managed. If the local people derive benefits from the wild animal resources in their area, they will police poaching and protect wildlife habitat from destruction by overgrazing and poor agricultural practices.

The intent here is to discuss wildlife species, their habitats, and the threats of human activities to the animals' continued existence in Chad. It is hoped these considerations will lead to programs that will help local villages benefit from protection they can provide to wildlife as they further develop their country.

# Introduction

Chad is one of the larger countries in Africa. It extends from the arid Sahara desert (24° N lat.) to the large rivers and equatorial forests of the south (8° N lat.). The variety of habitats existing in this spectrum of climatic conditions originally supported a richness and diversity of birds, large mammals, and other vertebrates that was comparable to the fauna of eastern and southern Africa. In the last several decades, however, Chadians have seriously depleted their fish and wildlife resources and have greatly reduced the ability of their environment to support wild animals.

Chad has suffered from either civil strife, drought, or famine almost continually since gaining independence from France in 1960. The growing human population has expanded the area used for agriculture and has increased numbers of both resident and transhumant livestock grazing on rangelands. This intensity of land use has reduced the quantity and the quality of habitats for wildlife despite remedial efforts (Depierre and Gillet 1971). The opening of boreholes, which enabled former nomadic people and their herds to remain continuously in areas that previously were only grazed for relatively short periods, has also had an adverse impact on wild ungulates in drier sites (Newby 1980). Periodic drought throughout the 1970s and 1980s, in addition to civil wars, depressed cotton prices in 1985, and invasions of desert locusts (*Schistocerca gregaria*) between 1986 and 1988 exacerbated the deteriorating conditions for peasant farmers.

The herds of wild ungulates, the larger birds such as ostriches and bustards, and the abundant

fish resources were heavily utilized to supplement crops during periods of food scarcity. As elsewhere in Africa, guns, ammunitions, and vehicles acquired for combat between rival forces provided mechanisms for harvesting wildlife at a scale not previously possible (Newby 1980). Demand for food and wanton killing of game resulted in severe reductions in many animal populations. Thomassey and Newby (1990) reported that elephant (*Loxodonta africana*) and black rhinoceros (*Diceros bicornis*) were severely harvested during this period and that an outbreak of rinderpest in 1982 and 1983 seriously reduced populations of buffalo (*Syncerus cafer*) and giant eland (*Taurotragus derbianus*).

Yet the fish and wildlife resources in Chad today still are sufficient, if used properly, to create incentives for local villages to protect and manage remaining populations. Villagers have learned that over-harvest and habitat destruction can greatly reduce fish and wildlife populations of value to them, and they realize that those resources will be lost unless they are afforded protection and properly managed. If the local people derive benefits from the wild animal resources in their area, they will police poaching and protect wildlife habitat from destruction by overgrazing and poor agricultural practices.

The intent here is to discuss wildlife species, their habitats, and the threats of human activities to the animals' continued existence in Chad. It is hoped these considerations will lead to programs that will help local villages benefit from protection they can provide to wildlife as they further develop their country.

# Animals and Plants of Chad

## BIRDS OF CHAD

The first listing that included birds in Chad was by Malbrant (1952), who described the characteristics and range of 527 species in French Central Africa (Chad and the northern two-thirds of the Central African Republic). A rather comprehensive survey of birds in Chad was undertaken by Salvan (1967, 1968, and 1969), who visited all 14 prefectures and recorded a total of 488 species. Vielliard (1971 and 1972) continued those surveys and integrated his and Salvan's findings into a checklist with revised taxonomy that included 464 species. Stuart and Adams (1990) estimated there were 496 species in the country. Vielliard (1971) reported that 59 species of raptors occurred in Chad. Serle et al. (1977) is a good guide to the birds that occur in Chad, but not all the species recorded in Chad are described or illustrated. Bird names in this paper follow Clements (1991).

## MAMMALS OF CHAD

No reference exists that describes the kinds, abundance, and distribution of mammals in Chad. Malbrant (1952) included 71 species of larger mammals, 66 rodents, 21 bats and 8 insectivores in his account of the mammals of French Central Africa. Happold (1987; Table 1.4) listed mammals that occur in the Sudanian and Sahalian savannas in Nigeria, which includes most of the mammals that would be expected in southern Chad. He listed 50 larger mammals (which, of course, did not include the 15 large mammals that occur in northern Chad), and 22 rodents, 22 bats, and 8 insectivores. Kindler et al. (1989) claimed very few of the 60-65 medium to large mammals of Chad survived outside of the Zakouma National Park. Vielliard (1974) recorded 21 species of bats from Chad. Stuart and Adams (1990) estimated there were 131 species of mammals in Chad.

Fiedler (1994) discussed the problems created by certain rodents in eastern Africa. Mammal names in this paper follow Wilson and Reeder (1993).

## FISHES OF CHAD

As in the case of the mammals and birds, Chad was blessed with an exceptional number of species and abundant quantities of fishes. However, over-exploitation, drought, and wetland degradation have drastically reduced the catches of what had been a major industry. In Lake Chad, the most important fishes have been the characin (*Alestes baremoze*) and the Nile perch (*Lates niloticus*). The former has drastically decreased in numbers, while the latter, which used to attain a very large size, now seldom exceeds 5 to 8 kg. The distribution of fish species in Chad is largely determined by the catchments which segregate them. These include: the extensive Lake Chad basin; the smaller Lake Fitri basin in central Chad; the isolated southwestern watershed of the Mayo-Kebbi river; and the streams, wadis, and gueltas (pools) of the Tibesti-Ennedi massifs.

The fishes of the Lake Chad basin and those of the adjacent Mayo-Kebbi basin have been studied extensively by Blache and Miton (1963) and Blache (1964). Their works are used for names of fishes in this paper. Nelson (1976) grouped the species of fishes in Chad into 12 families, suborders, and subclasses. Stuart and Adams (1990) gave a figure of 130 species of fishes in Chad.

## REPTILES AND AMPHIBIANS OF CHAD

There apparently is no comprehensive review of this component of the Chadian fauna. Little work has been done on the distribution and systematics

with the Central African Republic, is relatively undisturbed. This area of open woodlands interspersed with grassy wetlands is protected by prolonged seasonal flooding.

Fourteen species of antelopes are present in the south (Thomassey and Newby 1990). An aerial census in 1986 that covered 50,000 km<sup>2</sup> of the Salamat showed good numbers (300 to 3000) of bubal hartebeest (*Alcelaphus buselaphus*), tiang (*Damaliscus lunatus*), roan antelope (*Hippotragus equinus*), elephant, giraffe (*Giraffa camelopardalis*), buffalo, and ostrich. The giant eland exists only in the extreme south of Chad, where populations are probably sustained by individuals from adjacent National Parks in the Central African Republic. If black rhino still occur near Pala in southern Chad, they probably survive only because of protection offered by the Parc National de Bouba Ndjida, which lies in Cameroon just across the Chadian border.

The Sudanese and Guinean savannas that extend across Africa provide the life requirements for diverse kinds and impressive numbers of migrant birds (Morel 1973). About 480 species and subspecies, and perhaps 5 billion individual birds from the palearctic region of Europe and Asia migrate regularly to tropical and southern Africa (Moreau 1972). However, most of those birds winter north of the equator. Examples are members of the warbler family (Sylviidae), such as the whitethroat (*Sylvia communis*) and the willow-warbler (*Phylloscopus trochilus*), and other important groups such as swallows, shrikes, eagles, buzzards, harriers, kestrels, and kites. In addition, over 500 species and subspecies of African birds undertake seasonal migrations within the continent. Many of those afrotropical migrants breed in or move through the savannas of Africa, including those in Chad. As with all animals, it is essential to maintain quality habitat to ensure the continued abundance of these birds.

Some birds have benefited from agricultural expansion in the savanna and are sufficiently common to be a major threat to grain crops. Examples are the redbilled quelea (*Quelea quelea*),

golden sparrow (*Passer luteus*), village weaver (*Ploceus cucullatus*), and fire-crowned bishop (*Euplectes hordeaceus*). Quelea breed in dense colonies in thickets of acacia in the Lake Chad basin, and are periodically poisoned with aerial applications of fenthion.

## RIVERS AND FLOOD PLAINS

In Chad, the principal rivers arise from watersheds in either the Central African Republic (the Chari and Logone Rivers) or the Salamat flood-plain in Chad, which includes the Bahr Salamat, the Bahr Keita, and the Bahr Aouk (Fig. 2). The Mayo-Kebbi arises near Pala in the south and drains into the Benue and Niger Rivers. Within Chad, all these rivers have extremely flat gradients (except for the Gauthiot Falls on the Mayo-Kebbi) and, as a consequence, have extensive and important flood plains.

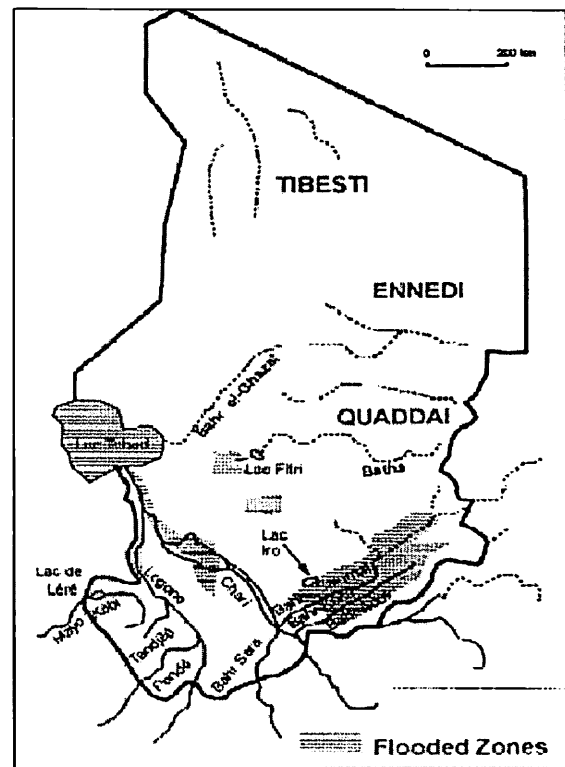


Figure 2. Major Rivers, Lakes, and Wetlands of Chad. (Adapted from Géographie du Tchad. EDICF. Paris. 48 pp.)

# Wildlife Management in Chad

## Organization and Activities

The Direction of National Parks and Faunal Reserves functions under the Ministry of Tourism and Environment in Chad. M. Daboulaye Ban Ymary was Director in 1993, and in the central office he supervised 36 employees in four Services; Park Management, Ecobiology, Legislation and Contracts, and Personnel and Procurement. In addition, he directed about 200 contract workers and laborers in the field. The Direction's activities are supported by National Ordinances Nos. 14/63 and 16/63 passed in 1963 and Decrees between 1961 and 1983 providing for hunting, the protection of certain animals, and the establishment of National Parks and Faunal Reserves. The National Ordinances are inadequate and antiquated and need to be revised. The Direction had a budget of 25 million CFA in 1993. This amount covered salaries but left virtually no funds for operations and equipment with which to undertake its responsibilities for the protection and management of Parks and Faunal Reserves and the enforcement of regulations protecting fish and wildlife. For the near future, this Directorate must rely on donor assistance for funding of operations. Additional funds are needed for wildlife management, law enforcement, all weather access roads, and education of the rural population on the benefits they can obtain from their wildlife resources.

Civil war and the breakdown of law and order in Chad during the last two decades, coupled with grazing crises arising from two periods of droughts, has caused widespread disruption in the patterns of land occupancy and use. Undisciplined militia and others acquired automatic weapons which enabled them to supplement their needs for meat and cash. National Parks and Fauna Reserves became target areas for hunting, elephant and rhino

poaching, and grazing by transhumant herds driven out of their normal migration corridors by war and drought. Existing legislation was unenforceable and was widely disregarded.

The elephant population plummeted from about 16,000 to 2,300 (Tchad 1991) and the black rhinoceros, the addax, and the scimitar-horned oryx probably were exterminated in Chad (Daboulaye Ban Ymary, pers. comm.). Due to worldwide concern for elephants and a need to establish sanctuaries for the remaining animals in Chad, the European Economic Community / Fonds European du Developpement (EEC/FED) sponsored a survey of numbers and distribution of elephants and helped prepare a management plan (Tchad 1991).

The Government of Chad began developing a National Conservation Strategy in 1990, and was proposing a National Strategy for Sustainability. Such documents will certainly be necessary for guidance and direction of future programs and in obtaining funds from international donors. Stuart and Adams (1990) discussed needed conservation activities including rehabilitation of protected areas and surveys of habitats and wildlife species. Chad is a signatory to the Convention Concerning Protection of the World's Cultural and Natural Heritage and to the African Convention of Nature and Natural Resources, but has not ratified the latter (Robinson, 1989). The government also has not ratified the following agreements (Goodman and Meininger 1989): the African Convention for the Conservation and Management of Wildlife and its Habitat, the African Convention of Nature and Natural Resources, the Convention on Wetlands of International Importance Especially as Waterfowl Habitat (RAMSAR Convention), the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES III), and the Convention for the Conservation of Migratory

# Threatened Vertebrates of Chad

Groombridge (1993) listed 20 threatened vertebrates for Chad — 16 mammals, 3 birds, and 1 reptile. He did not list any species as recently becoming extinct in Chad. Other authors have assessed the status of wildlife in Chad (Newby 1980, King 1981, Groombridge 1982, Collar and Andrew 1988, Kindler et al. 1989, Le Berre 1990, Stuart and Adams 1990, Thomassey and Newby 1990, Tchad 1991, and Wilson and Reeder 1993). From these discussions, the following list of threatened species was developed. Threatened species include those that are *E*, endangered; *V*, vulnerable; *R*, rare; and *K*, probably threatened (but insufficient information is available). It should be recognized that the status of animals can differ between countries and that the ability to classify animals is dependent upon current knowledge of their range, their abundance, and threats to their continued existence. Very little such information exists for animals in Chad, and only the larger animals about which the most is known are considered here.

## MAMMALS

Fennec fox	<i>Fennecus zerda</i>	K
Wild dog	<i>Lycaon pictus</i>	E
Pale fox	<i>Vulpes pallida</i>	K
Rueppel's fox	<i>Vulpes rueppli</i>	K
Cheetah	<i>Acinonyx jubatus</i>	V
Lion	<i>Panthera leo</i>	V
Leopard	<i>Panthera pardus</i>	E
Cape clawless otter	<i>Aonyx capensis</i>	K
Spotted-neck otter	<i>Lutra maculicollis</i>	K
West African manatee	<i>Trichecus senegalensis</i>	V
Elephant	<i>Loxodonta africana</i>	V
Wild ass	<i>Equus asinus</i>	E*
Black rhinoceros	<i>Diceros bicornis</i>	E*
Giraffe	<i>Giraffa camelopardalis</i>	V
Dama gazelle	<i>Gazella dama</i>	E
Dorcas gazelle	<i>Gazella dorcas</i>	V

Red-fronted gazelle	<i>Gazella rufifrons</i>	V
Slender-horned gazelle	<i>Gazella leptoceros</i>	E
Buffalo	<i>Syncerus caffer</i>	V
Giant eland	<i>Taurotragus derbianus</i>	E
Sitatunga	<i>Tragelaphus spekei</i>	V
Greater kudu	<i>Tragelaphus strepsiceros</i>	V
Barbary sheep	<i>Ammotragus lervia</i>	E
Addax	<i>Addax nasomaculatus</i>	E*
Scimitar-horned oryx	<i>Oryx dammah</i>	E*
Red-flanked duiker	<i>Cephalopus rufilatus</i>	R
Yellow-backed duiker	<i>Cephalopus silvicultor</i>	K

\* May be extinct in Chad

## BIRDS

Ostrich	<i>Struthio camelus</i>	V
Marbled teal	<i>Marmaronetta angustirostris</i>	V
African fish eagle	<i>Haliaeetus vocifer</i>	R
Bateleur	<i>Terathopius ecaudatus</i>	R
Ayre's hawk eagle	<i>Hieraaetus ayresii</i>	R
Martial eagle	<i>Polemaetus bellicosus</i>	R
Lesser kestrel	<i>Falco naumanni</i>	R
Peregrine falcon	<i>Falco peregrinus</i>	R
Demoiselle crane	<i>Grus virgo</i>	V
Black-crowned crane	<i>Balearica pavonina</i>	V
Stanley bustard	<i>Neotis denhami</i>	V
Nubian bustard	<i>Neotis nuba</i>	V
Arabian bustard	<i>Ardeotis arabs</i>	V
White-bellied bustard	<i>Eupodotis senegalensis</i>	V
Black-bellied bustard	<i>Eupodotis melanogaster</i>	V
Senegal parrot	<i>Poicephalus senegalus</i>	V
Abyssinian ground	<i>Bucorvus abyssinicus</i>	V



- networks in the Lake Erie Basin. *Environ. Toxicol. and Chem.* 12:13-26.
- Robinson, P.J. 1989. The legal status of diurnal birds of prey in Africa. pp. 577-590. *In* B.-U. Meyburg and R.D. Chancellor (eds.) *Raptors in the modern world.* WWGBP. Berlin.
- Roux, F. and G. Jarry. 1984. Numbers, composition and distribution of populations of *Anatidae* wintering in West Africa. *Wildfowl* 35:48-60.
- Salvan, J. 1967, 1968, and 1969. Contribution à l'étude des oiseaux du Tchad. *L'Oiseaux et RFO* 37:255-284 (1967), 38:53-85, 127-150, 249-273 (1968), 39:38-69 (1969).
- Serle, W., G.T. Morel, and W. Hartwig. 1977. *The Collins Field Guide to the Birds of West Africa.* The Stephen Green Press. Lexington, Massachusetts. 351 pp.
- Société d'Eco Aménagement. 1992. Bird and mammal lists for Zakouma National Park. Extracted from an unpubl. report prepared for Direction Parcs National et Reserves Faunal. N'Djamena, Tchad.
- Steinberg, M. 1993. Protecting wildlands through culturally compatible conservation. *Environ. Conserv.* 20:260-262.
- Stuart, S.N. and R.J. Adams. 1990. Biodiversity in sub-Saharan Africa and its islands. *Occasional Papers.* IUCN Species Survival Commission. No. 6.242 pp.
- Tchad, République du. 1991. Plan de conservation de l'éléphant au Tchad. Ministère du Tourisme et de l'Environnement. N'Djaména, Tchad. Unpubl. report. 49 pp.
- Tchad, République du. 1992. *Annuaire Statistique 1991.* Division de la Statistique Agricole. Ministère du Développement Rural. N'Djaména, Tchad.
- Thiollay, J.M. 1975. Les rapaces des Parcs Nationaux du Tchad méridional. *L'Oiseau et RFO* 45:27-40.
- Thomassey, J.-P. and J.E. Newby. 1990. Chad. pp. 22-28. *In* P. East. (compiler). *Antelopes. Global survey and regional action plans. Part 3. West and Central Africa.* IUCN Gland, Switzerland. 171 pp.
- Tolba, M.K. 1992. A plan for Lake Chad. *GRID News.* 5: 1.
- Vielliard, J. 1971a. Avifaune du Lac de Léré et de sa région. *Cah. ORSTOM. Ser. Hydrobiol.* 5:225-239.
- Vielliard, J. 1971 and 1972. Données biogéographiques sur l'avifaune d'Afrique centrale. I. *Alauda* 39:227-278. (1971) and II. *Alauda* 40:63-92. (1972).
- Vielliard, J. 1972. Recensement et statut des populations d'anatides du Bassin Tchadien. *Cah. ORSTOM Ser. Hydrobiol.* 6:85-100.
- Vielliard, J. 1974. Les chiroptères du Tchad. *Revue Suisse Zoologique* 81:975-991.
- Wake, D.B. and A.G. Kluge. 1961. The Machris Expedition to Tchad, Africa. Amphibians and reptiles. Los Angeles County Museum Contribution to Science No. 40. 12 pp.
- Wanzie, C.S. 1990. Water resources management (WRM) and wildlife management in the lake Chad Basin. *Mammalia* 54:579-585.
- Warshall, P. 1989. Mali biological diversity assessment. Report prepared for USAID. Africa Bureau. Washington, D.C. by E/DI. Washington, D.C. and Office of Arid Land Studies. University of Arizona. Tucson, Arizona. 95 pp.
- Wells, M. and K. Brandon. 1992. People and parks. Linking protected area management with local communities. The World Bank. Washington, D.C. 99 pp.