



# Monitoring waterbird populations in three major wetland complexes of Sub-Saharan Africa



Office National  
de la Chasse  
et de la Faune Sauvage



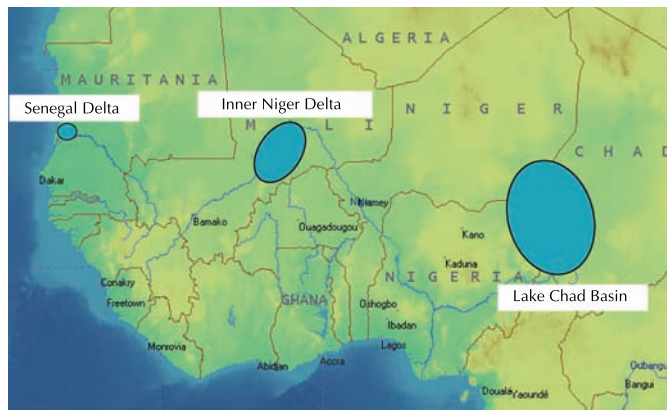


Millions of waterbirds migrate each year through Asia, Europe and Africa. These birds are generally widely dispersed during the breeding season, but during the dry season in the Sub-Saharan wetlands, many of them concentrate in huge flocks. The dry season, approximately October to March, is therefore a particularly good time to census waterbirds in West and Central Africa. The "Office National de la Chasse et de la Faune Sauvage" (ONCFS, a governmental agency responsible for wildlife and hunting management in France) has been involved in monitoring waterbirds in several countries of this region since the 1990's. More recently, a three-year programme (2006-2008) was initiated by the ONCFS, in order to simultaneously census birds in this extensive region. This programme, undertaken in close cooperation with several organisations, was designed to support the International Waterbirds Census (IWC) coordinated at international level each January by Wetlands International. The censuses were made in the three main wetland complexes, located immediately south of the Sahara, in West and Central Africa.

- The Senegal Delta, shared by Mauritania and Senegal, is an alluvial plain of about 1 100 square kilometres. It includes the Oiseaux du Djoudj and Langue de Barbarie National Parks in Senegal, as well as the Diawling National Park and surrounding wetlands in Mauritania. Several hydrological works have been carried out in

this delta, and water control is partly possible in several wetlands.

- The Inner Niger Delta in Mali, extends over a huge flood plain, oriented SW-NE, 400 kilometres long and 90 kilometres wide, between Djenne and Timbuctou. Between September and January, rainfall and river flooding temporarily inundate wetlands covering about 10 000 to 25 000 square kilometres.
- Lake Chad and surrounding wetlands (Logone Valley, Lower Chari, Lake Fitri, etc.) have been only slightly modified by man, and can extend over a huge area (more than 60 000 square kilometres). Their total area and period of maximal extent greatly vary between years, in relation to rainfall and river floods. Lake Chad alone, is shared by Cameroon, Niger, Nigeria and Chad.



Location of the three major Wetland complexes south of the Sahara, in West and Central Africa.

Although the current programme has focused on the most extensive wetlands of the region, this certainly doesn't mean that smaller wetlands in the area are not important. On the contrary, their number, dispersion and often strategic location give them a great importance as far as bird migration is concerned. However, counting birds in these smaller wetlands is relatively "easier" than counting them in the three major wetlands.

Some smaller wetlands of Eastern Mauritania have also been monitored in the framework of this project.



Coastal wetlands in the Senegal delta.



## Wetlands are vital for local populations

In the Sahel, water creates multiple benefits. Wetlands are therefore of capital importance for local human populations. Many different activities take place in the wetlands, often undertaken in specialised ways by different ethnic groups, and sometimes following very ancient and traditional rules. These wetlands are also of particular interest for development projects, especially in the context of increasing populations and growing demands for food security.

It is therefore crucial to develop methods for exploiting these wetlands that correspond to the wishes of local populations, whilst ensuring the preservation of natural resources for the future.

- Cattle grazing : huge grazing areas are available for cattle, within or adjoining these wetlands. At the end of the dry season, the wetlands remain the only available grazing places for cattle.

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- Fishing : for most people living in these wetlands, fish represent the main available supply of animal proteins. Coastal wetlands also serve as vital spawning areas and nurseries for pelagic species of fish, later caught at sea.

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Fish constitute a vital natural food resource for people living near wetlands. They also play an important role in biodiversity.

- Hunting : in Mali, waterbirds are caught in some places in the Inner Niger Delta using fishing nets. They are generally consumed in the delta or sold on local markets. In the Senegal delta and Chad Basin, hunting is also a leisure activity which remains strictly regulated by national governmental organisations responsible for wildlife management.

- Agriculture : the seasonal alternation of periods of flooding and drying out allows different types of agriculture to be practiced. Rice can be directly produced



ONCFIS / B. Trolliet

in floodplains whilst recessionary cultivation (sorgho, vegetables etc.) are planted around the wetlands, progressing as the water gradually recedes and as the wetlands retract.

- Tourism : this activity has just recently developed but might increase in intensity in the coming years. The great diversity of animal and plant species found in wetlands, as well as the beauty of the landscape, might constitute the basis for a specialised type of tourism focused on nature.

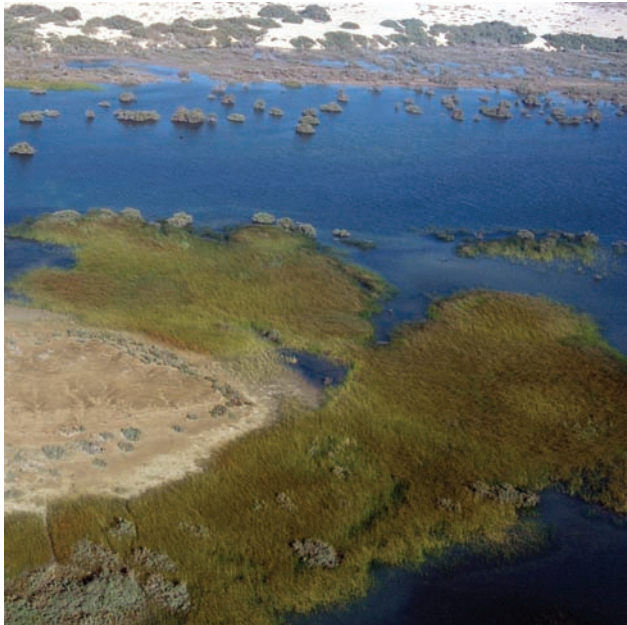


CIRAD / P. Poillecot

**Waterbird censuses are particularly difficult to carry out in extensive wetlands**

Huge concentrations of diverse species of birds can be found in each of the wetland complexes. During the same season, movements of birds from one complex to another are poorly documented but it is likely that birds are moving from one place to another, in relation to water levels and therefore food availability. In order to obtain a correct estimation of the populations size,

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Many temporary wetlands exist on the southern edge of the Sahara.

it is therefore necessary to census the birds simultaneously in each of these three major wetland complexes. Due to the enormous size of Lake Chad and the Inner Niger Delta, the use of tourism planes is necessary to ensure satisfactory coverage of these sites.

Amongst these three wetland complexes, the Senegal Delta was the only one to be completely and regularly covered during the last twenty-five years. Before the current programme, these three major wetlands had only been completely and simultaneously counted four times (Pérennou, 1991). The current programme allowed us to make a complete and simultaneous January waterbirds census in the three wetland complexes from 2006 to 2008.

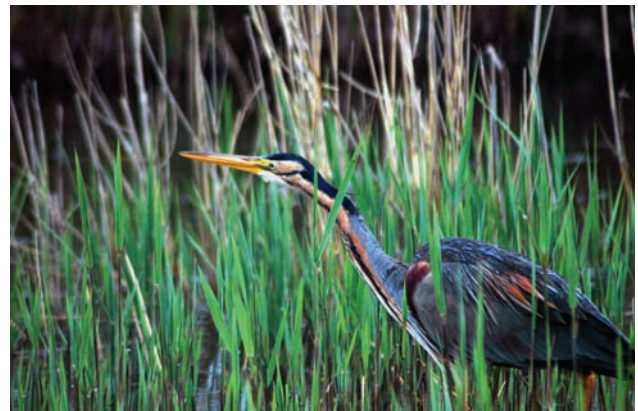
**A very important diversity of species**

Amongst the numerous animal species living in wetlands, the birds represent an abundant, diversified, and spectacular group. They constitute a very important part of biodiversity.

The waterbirds found in these wetlands are either migratory leaving Africa to breed in Eurasia (Palearctic migrants), or sedentary remaining in all seasons in Africa (Afro-tropical species). The sedentary birds may have major movements within the continent, however, such movements within Africa remain little known.

Five main groups of waterbirds can be found in these wetlands.

- Pelicans and their relatives have webbed feet and are well adapted to catching fish by swimming underwater to capture their prey.
- Herons and their relatives, are generally big wading birds with long legs, long necks and stout bills. They feed on land or in water, walking slowly while searching for food, or waiting for their prey.



D. Gómez / Tour du Valat

Purple Heron (*Ardea purpurea*).  
The European breeding population winters in Africa.

- Ducks and Geese have webbed feet, flat bills and generally feed in wetlands. Some species eat while swimming at the water surface, others submerge or even dive to feed on the bottom.
- Waders includes many different species, such as plovers, sandpipers, snipes, godwits, curlews etc. They

Years	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08
Lake Chad Basin	Green	White	Green	Green	White	White	White	White	White	White	White	White	White	White	White	White	Green	White	White	White	Yellow	White	Green	Green	Green
Inner Niger Delta	Green	Yellow	Green	Green	White	White	White	White	Yellow	White	Yellow	White	White	White	White	Yellow	Green	Yellow	White	White	White	White	Green	Green	Green
Senegal Delta	Green	Yellow	Green	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Green	Green

Waterbirds mid-winter census coverage of the three wetland complexes.  
Yellow: years when complete coverage was achieved.  
Green: Years when the three complexes were fully covered.





X. Ruffray

Royal Terns occur mainly on the coastal wetlands but occasionally venture up the rivers outside the breeding season.

generally have long legs and the majority of species eat small invertebrates picked out of the sediment along the shores of the wetlands.

- Gulls and terns are generally black and white birds. They search for food while flying over the wetlands or at sea. Whilst most species of terns forage by diving for fish, gulls also tend to forage on garbage left by humans.

## Methods

In the Senegal delta, counts were made from the ground on both sides of the river (Mauritania and Senegal) by about 50 observers. Most of the observers were trained and equipped with telescopes and binoculars attributed in the framework of a former project (Rézo, from 1998 until 2002) coordinated by ONCFS and co-financed by the European Union. "Ground counts" were made from determined spots, and sometimes boats were used. Several training sessions for observers were organised before and after the census day.

In the Lake Chad Basin and in Mali, counts were made using small tourism planes, representing about 120 flying hours in total each year. The size of the groups of waterbirds for each species was estimated by observers who recorded their counts throughout the flight. Because of the speed of the plane and the mobility of certain waterbirds, observers had to instantly identify the different species. Aerial counts are not very suitable for dispersed and small species, whose numbers can be under-estimated. Ducks, herons and other large

waterbirds such as Black tailed Godwits (*Limosa limosa*) and Ruff (*Philomachus pugnax*) can, on the contrary, be counted by plane in a relatively accurate way.



ONCFS / M. Benneguit

## Résultats

### Numbers and Distribution

About three millions birds were counted on average in these three wetland complexes in January 2006, 2007 and 2008. This impressive number, about a third of the waterbirds count in the whole of Africa in January 2000 for instance (Dodman & Diagana 2003), clearly shows the great importance of these three wetland complexes.

Ducks and Geese amount to about two thirds of the total number of waterbirds counted in the area.

With about 1.3 million individuals on average, the Garganey (*Anas querquedula*) is by far the most abundant species of duck found in these three wetlands.

Afro-tropical ducks numbers amount to 380 000; the most abundant species being the White-faced whistling-duck (*Dendrocygna viduata*) making up approximately 83% of the Afro-tropical ducks' count.

A little less than half a million waders were counted, from which 80% were Ruff. Black tailed Godwits (11% of the average count of waders) and Black-winged Stilt (6%) were the second and third most abundant species.

Interesting numbers of many other species (herons, storks, cranes etc.) were counted in

these three major wetlands, and specific papers giving more detailed results will soon be written.

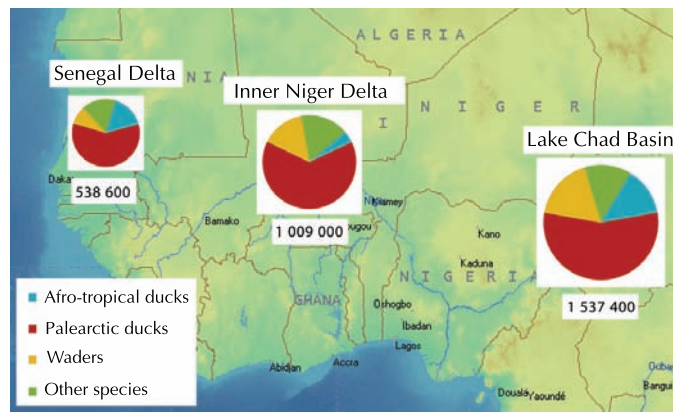
It is also interesting to note that the distribution of birds has also changed significantly amongst the three wetland complexes in the different years of the survey. This clearly shows the necessity to census simultaneously these three wetlands.

### Variations in numbers between the 1980's and today

The comparison of numbers of ducks counted in the 1980's with the numbers counted from 2006 to 2008 gives information on the trends in numbers of the different populations.

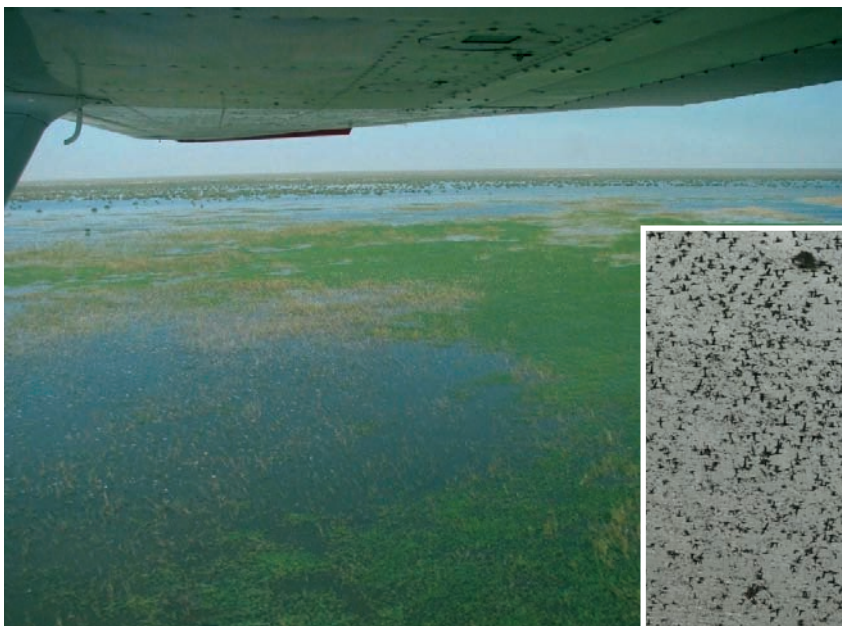
Numbers of Palearctic ducks were roughly in the same order of magnitude in the two different periods, with the exception of the Ferruginous duck (*Aythya nyroca*), for which numbers in the area seem much higher today. Larger variations were noticed for Afro-tropical ducks. Whilst the White-faced Whistling-duck numbers greatly increased, Fulvous Whistling-duck (*Dendrocygna bicolor*) numbers declined by 90% between the two periods.

It is interesting to note that no massive mortality of wild birds was noticed during any of the surveys carried out in the area. Such events were feared at the time due to the



Distribution and numbers (average 2006-2008) of the main bird groups on the three major wetland complexes.

ONCF5 / O. Girard

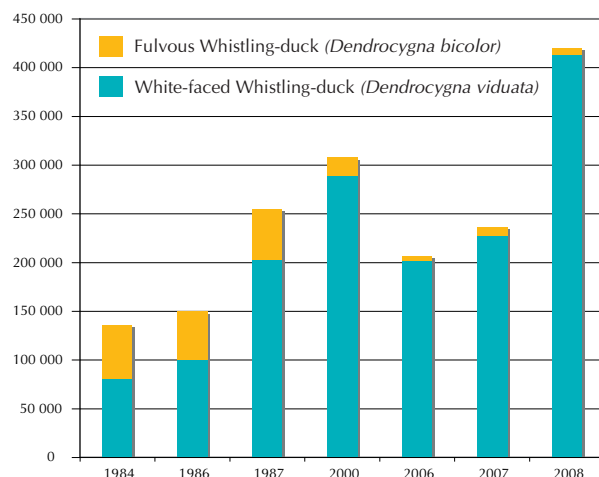
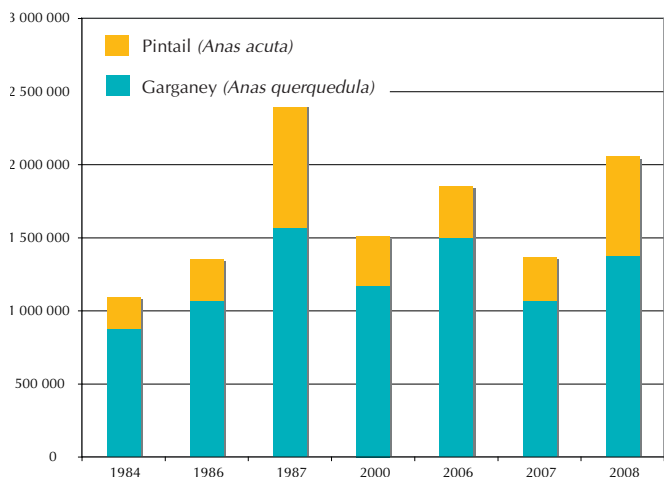


Small planes are used for censusing waterbirds on the very extensive wetlands difficult to access on the ground.



ONCF5 / O. Girard





Total numbers of some Anatidae species censused in January on the three major wetland complexes. (source of the data from the 1980's: Pérennou 1991 ; others: ONCFS and partners).

detection of a few mortal cases of Highly Pathogenic Avian Influenza in wild birds in Eurasia.

It is also important for individuals, communities or organisations who harvest some of these natural resources to fully participate in studies aiming at determining the sustainability of the harvests.

### Conclusions

The knowledge and monitoring of the abundance of natural resources, such as waterbird populations, are necessary to evaluate the likely consequences of important changes, either anthropogenic or climatic, that may affect sub-saharian wetlands in the medium-term.

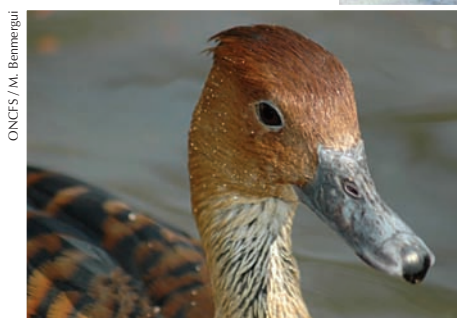
A solid scientific knowledge of the state of these resources should allow us to develop the most adapted measures for their conservation.

This programme can be considered an important contribution in these fields. Because of the high costs to carry out such a monitoring programme, it was recommended at the ANATIDAE 2000 conference to concentrate such censuses on just a few successive years, but to repeat them on a regular basis. The current programme was designed to meet these recommendations. The organisations involved hope to repeat the censuses in the near future, and that more partners will join us in order to improve the surveys.

The numbers of Fulvous Whistling Ducks (below) recently censused are much lower than those reported in the 1980s



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## For further information...

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- [www.oncfs.gouv.fr](http://www.oncfs.gouv.fr)

Front cover photographs: top: ONCFS / B. Trolliet; bottom: ONCFS / M. Benmergui



ONCFS / M. Benmergui



This programme was carried out in cooperation with governmental and non-governmental organisations :

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