



Preliminary data on the diversity pattern of waterbirds of Chott El-Hodna (Central High Plateaux-Algeria)

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Abstract

In this pioneering work on the aquatic avifauna of Chott El-Hodna (Central High Plateaux), we present results obtained through monthly companies of waterbirds counts started from September 2007 to September 2009. On this wetland of international importance under Ramsar convention, a total of 39 species of water birds representing 12 families have been recorded. The family of ducks is the most represented by 10 species. Amongst of all species, 20 of them are wintering species, 12 are visitors, 06 are resident breeder species as well as the Ruddy Shelduck *Tadorna furruginea* and Black-winged Stilt *Himantopus himantopus* etc. Only one species has breeder- migrant status as well as the white stork *Ciconia ciconia*. However, 11 species are protected under Algerian law, which one species is listed in (VU) Category of Red List of endangered species (Teal marbled *Marmaronetta angustirostris*) by the International Union for Conservation of Nature (IUCN).

Keywords: Waterbirds, Chott El Hodna, Status, diversity, Algeria

Introduction

Algeria contains a wide variety of wetlands which are important staging posts and wintering grounds for birds migration in the Palearctic (Stevenson et al. 1988; Coulthard 2001; Boulekhssaim et al.2006).

The bird fauna of Algeria is relatively well known, due to data collected by dedicated ornithologists over the past two centuries (Heim de Balsac & Mayaud 1962, Isenmann & Moali 2000, Boumezbeur 2002). These early works are based on dispatched observations recorded intermittently in few wetlands. High Plateaux, especially those in the center contain high diversity of birds remains poorly known, where the only study was carried out by Jacob & Jacob (1980) in Boughzoul Lake. Chott El-Hodna, with its large surface, its strategic location at the center of the country and its biodiversity richness, was classified as a wetland of international importance under the Ramsar convention in 2001.

In order to know the importance of the Chott for waterbirds, who has never benefit an ornithological study, we present preliminary data of monthly companies of waterbirds surveys that have been made regularly from September 2007 to September 2009. This work aims to:

- Determine the ornithological value of this site, and it's nationally and internationally importance.
- Determine the status of species used this wetland.

Material and Methods

Chott El-Hodna (35 ° 18 ' / 35 ° 32' N 4 ° 15 ' / 5 ° 06') with more 362,000 ha, located in the semi-arid Central High Plateaux (CHP) of Algeria. The study area has a semi-arid climate, with an annual mean temperature of 25 °C and an average annual rainfall of less than 400mm. The landscape is dominated by steppe vegetation. This salt lake is part of a series of salt pans scattered in the middle part of country,

which are developed where the waters converge from the Saharan Atlas mountains in the South and the Tell Atlas mountains to the North. It is wedged between two mountains formations, hydrologically is a closed Hadna basin over 26.000 km², extending 220 km of long and 70 km of wide (Fig 1).

The Chott straddles two wilayas: M'sila (1000 Km²) and Batna (100 km²), it is isolated from the Mediterranean Sea from 100 to 150 km of mountain ranges. This salt pan occupy the center of the bowl of Hodna, it is located about 40 km from M'sila City (Ladgham Chicouche & Zerguine, 2000), it was selected as Important Bird Area (IBA) and classified as wetland of international importance under the Ramsar convention in 2001 (Coulthard 2001). The Chott extends over 77 km long and 19 km wide. Where flooded part never exceeds 80.000 ha, it feeds mainly by at least 22 major oueds, with a further source of fresh water (Ladgham Chicouche & Zerguine, 2000). The importance of Chott El-Hodna in the biodiversity conservation can be summarized by the presence of some endemic flora species, as representative of the Mediterranean part, this flora is represented by 550 taxa identified in the steppe communities, forest and pre-forest (Kaabeche 1990).

With their different habitats, the Chott is the natural area of great importance for animal species (Cuvier's Gazelle *Gazella cuvieri*, Houbara Bustard *Chlamydotis undulata*), endangered species listed by the International Union for Conservation of Nature (Ladgham Chicouche & Zerguine, 2000).

The main objective of our study is to identify and assess waterfowl who attended the site and to determine their phenological status to show the role of Chott El-Hodna in the conservation of biodiversity and particularly waterbirds. The study of waterbirds phenology was undertaken through monthly companies of birds count from September 2007 to September 2009 using a telescope KONUSPOT (20 × 60). The surveys were conducted at several stations around the wetland, in the order to obtain consistent data.

We used individual count when the numbers of birds present were small. When more than 200 birds were present, total numbers were estimated by dividing the flock into small equal blocks (50–200 birds according to flock size) and counting the number of blocks (Blondel 1975). This last method is the most used in the winter counts of waterfowl (Lamotte & Bourliere, 1969)

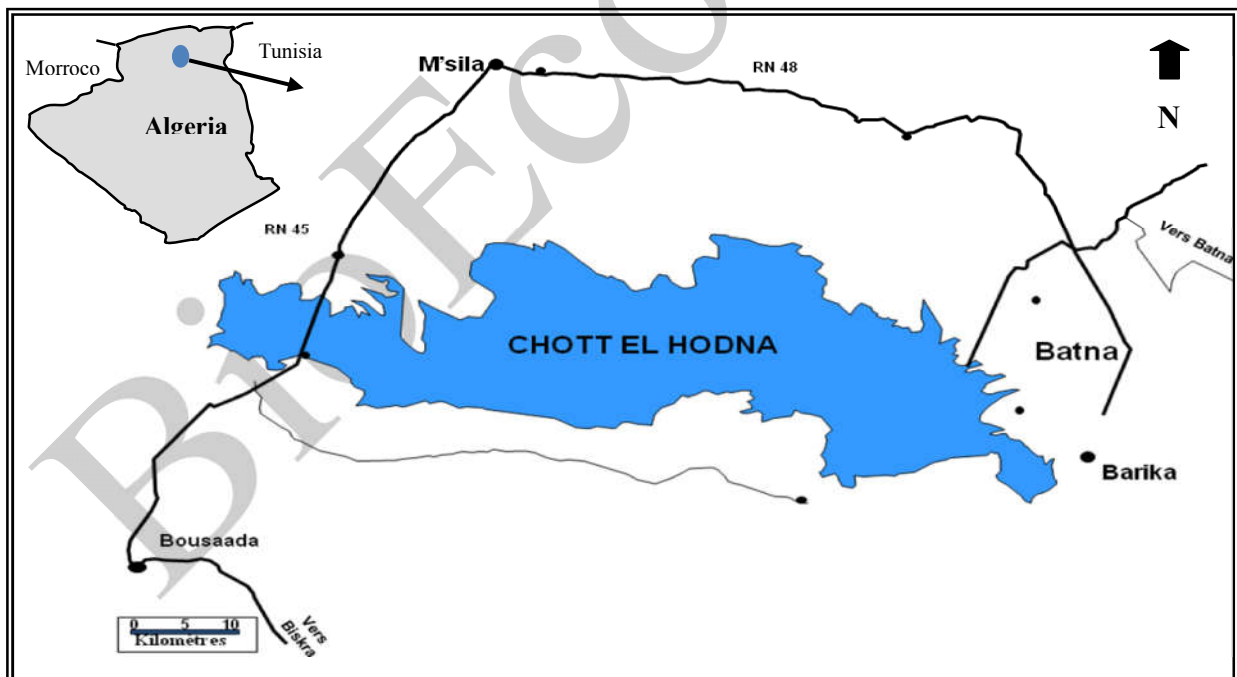


Figure 1. Geographic situation of study area.

Results

Under this item we present assessed species regrouped within families and their phonological status and census.

Ardeidae

Cattle egret *Bubulcus ibis*- Resident Breeder species- Observed most of the year in the middle or in the outskirts of the site. Generally, their nests are made up of *Eucalyptus sp* trees in monospecific colony



located around the wetland. This species use the site border areas for resting and foraging. The highest number was observed during May and June (1000 individuals).

Grey Heron *Ardea cinerea*- Wintering species-(October-May): This wader observed through all the wintering period. They are generally solitary and territorial, and they occupy the satellite place of the Chott and water outfalls. Particularly at Oued M'sila just upstream of the K'sob dam where there are fish loosen, a maximum of 52 birds were found on 24 February 2008.

Little Egret *Egretta garzetta*- Wintering species-(October-March): Observed through the wintering period with low numbers varied between 20 and 30 individuals. A maximum of 72 birds were recorded on 6 March 2008. This is probably due to a migrating passage from another population by this site.

Great Egret *Ardea alba*-Migrant species- It was observed two or three times on this site, mainly during periods of transition. 11 birds were reported on 10 December 2007 in the outskirts near the phragmites of the Chott.

Ciconiidae

White Stork *Ciconia ciconia*-Migrant Breeder- Hundred of nests are placed on electrical post and dead trunks of palm trees in the bordering villages of the Chott and in M'sila's down-town. There was a remarkable increase in the installation of new nests during latest years. They were regularly observed in the wetland to feeding, from January till August. The maximum of 157 individuals was recorded in the site on 4 September 2009.

Phoenicopteridae

Greater Flamingo *Phoenicopus roseus*- Wintering species- This characteristic species of salt wetlands, are regularly present early in September until the end of May with high numbers, where a maximum of 2800 birds were recorded in March 2008. Observations of chicks were reported by local population in 2004 or earlier. Egg fragments witnessed confirmed the successful breeding of this species in the islets within Chott.

Anatidae

Eurasian Wigeon *Anas penelope*-Wintering species- These ducks were present regularly during the period from October to March with fluctuating abundance. A maximum of 440 individuals were observed in February 2008. It was particularly in the southern part of the Chott near to the phragmites.

Gadwall *Anas strepera*-Migrant species- These ducks were observed two or three times through the study period principally during migration periods in September and February (150 birds on 24 February 2008). It seems that the Gadwall uses the Chott as a staging area before or after crossing the Sahara desert (long-distance migration).

Northern Pintail *Anas acuta*-Migrant species- These ducks were observed two times during all study periods. This may be explained that this species used the site as stopover in pre and post breeding journey. A maximum of 142 individuals were observed on 11 March 2008.

Mallard *Anas platyrhynchos*-Wintering species- This cosmopolite bird, stay generally over six months (October-March) through wintering period in Chott El-Hodna. Maximum of 360 birds were recorded in January 2009.

Shoveler *Anas clypeata*-Common Wintering species- These ducks were observed regularly during winter in the Chott from September to March. The maximum of 1640 birds were recorded on 19 December 2008.

Common Teal *Anas crecca*-Wintering species- They were observed in Chott El-Hodna as early as September with a considerable number especially during the wintering season 2008/2009. A maximum of 2250 individuals were counted in January 2009 and 1850 individuals in February 2009.

Marbled Teal *Marmaronetta angustirostris*-Wintering species- They were present in the Chott during winter with limited number (30-40 individuals), with the exception of 2008/2009 winter season, where the maximum of 88 individuals were observed on 9 November 2008.

Ruddy Shelduck *Tadorna ferruginea*-Resident Breeder species- They were present all the year, with a maximum of 640 birds in February 2008. Two populations were distinguished, a wintering population and a breeding population. The breeding population reached about 50 breeding pairs (11 June 2008), and one pair with seven sub-adults was observed near Barika (eastern part of the Chott) on 17 June 2009.

Common Shelduck *Tadorna tadorna*-Wintering species- They were observed regularly in the Chott from September to March with remarkable numbers, especially in the South part of the wetland with other ducks. The maximum of 2750 was noted in March 2008.

Common Pochard *Aythya ferina* -Migrant species- This species was observed twice particularly during post-breeding period (November 2007) with a maximum of 290 individuals.



Accipitridae

Western Marsh-harrier *Circus aeruginosus*-Wintering species- This species was present in Chott El-Hodna, especially in the Reed in southern part. It was observed throughout the wintering period from October to April, with low numbers. A maximum of 22 individuals were observed in October 2007.

Egyptian culture *Neophron percnopterus*-Migrant species- This species was observed in three distinct times; 17, 30 and 24 individuals in February 2009, March 2009 and October 2007 respectively. It prefers the western edge of the Chott near the waste discharge in the municipality of Chellal.

Rallidae

Common Coot *Fulica atra*-Wintering species- It colonizes the Chott during the winter period from September to March. They were observed in limited numbers. A maximum of 89 individuals were recorded on 19 December 2008. The coot occupies mostly the Phragmites of khobana (Southern part of the site) with Common Moorhen.

Common Moorhen *Gallinula chloropus*-Resident Breeder species- Maximal number estimated was 87 individuals during the winter period (January 2008). However, 12 breeding pairs were observed during the breeding period in 2008 in the boundary waters attached to the site containing the Phragmites. Egg fragments and nests with eggs were found in the vegetation which confirmed that breeding was successful for this species.

Gruidae

Common Crane *Grus grus*-Wintering species- It winters regularly for several years, and its number has increased continuously from the end of September by the successive arrivals of European populations. This reaches a maximum of 480 individuals during January. This bird seems to prefer the high plains and is highly targeted by hunters (Houhamdi et al, 2008). It is often observed in the cereal culture bordering the Chott from the North part, mainly in feeding activity.

Recurvirostridae

Black-winged Stilt *Himantopus himantopus*-Resident Breeder species- was observed throughout the year with fluctuating numbers (Maximum of 274 individuals were observed on April 22, 2008 and more than 35 breeding pairs on 2 June 2009 in the southern part of the Chott). Nests of 3 to 4 eggs were found by local people in the southern edge of the Chott.)

Avocet *Recurvirostra avosetta*-Resident Breeder species- This sedentary species was present through the year in the Chott, especially in shallow water depth places. A maximum of 310 birds were recorded in March 2009. About twenty breeding pairs were observed during the months of June and July in the Chott. Eggs were found in the southern shore of the Chott next to Oued M'cif on 12 June 2008 and three chicks were found on 25 June 2008. This confirmed that breeding was successful.

Charadriidae

Little Ringed Plover *Charadrius dubius*-Migrant species- Two observations were recorded for this species with a maximum of 1950 individuals noted on 18 January 2009.

Kentish Plover *Charadrius alexandrinus*-Resident Breeder species- This species was represented by two populations. Wintering population and sedentary population were present through the year with fluctuating numbers. A maximum of 2200 individuals were noted on 18 January 2009. The sedentary status was confirmed by the presence of more than 30 breeding pairs during May and June in both 2008 and 2009. Nests of two and three eggs were found in the southern bordering of the Chott during the same period.

Ringed Plover *Charadrius hiaticula*-Migrant species- This wader has the same status as the Little Ringed Plover *Charadrius dubius*. It has been reported only once, on 9 November 2008 with about 325 individuals.

Northern Lapwing *Vanellus vanellus*-Migrant species- This species was observed three times in the Chott during two specific months (October and December, with a maximum of six birds on 19 December 2008) during the two years study period.

Scolopacidae

This family was represented by nine species which is composed of five Migrant species and four wintering species.

Migrant species include Common Snipe *Gallinago gallinago*, a maximum of 221 individuals were noted on 22 April 2008; Dunlin *Calidris alpina*, a maximum of 32 individuals were observed on 12 November 2007; Sandpiper *Tringa stagnatilis*, a maximum of 93 individuals were reported on 10 December 2007; Common Redshank *Tringa totanus* were up to 127 birds marked on 18 January 2009 and 38 individuals of



Black-tailed Godwit *Limosa limosa* were observed on 18 January 2009. These migrant species were mainly observed once or twice during the study period especially during their post-breeding passage. The four wintering species present were Spotted Redshank *Tringa erythropus*, a maximum of 335 individuals were observed on 10 December 2007; Common Greenshank *Tringa nebularia* were observed on 9 February 2009 (200 birds); Little Stint *Calidris minuta*, a maximum of 97 individuals were observed on 6 March 2008 and a maximum of 125 individuals of Common Sandpiper *Actitis hypoleucos* were observed in November 2007. Indeed, some species of these waders were represented by two different populations: a wintering population and migrant population.

Laridae

Black-headed Gull *Chroicocephalus ridibundus*-Wintering species- This species was present throughout the wintering period but were few in number (a maximum of 17 birds were seen on 18 January 2009).

Little Gull *Larus genei*-Wintering species- It was present during winter. The maximum of 18 individuals were marked on 10 December 2007.

Sternidae

Whiskered Tern *Chlidonias hybridus*-Migrant species- This occasional visitor was observed two times in the Chott through the period of our study, the maximum of 02 individuals were observed in April 2009.

Discussion

Chott El-Hodna wetland by this exceptional biodiversity remains unexplored until now. During the period from September 2007 to September 2009, approximately 39 water birds species representing 12 families were recorded in this wetland. These species represent different phonologic status: Twenty wintering species (51%), twelve migrant species (31%), six resident breeder species (15%) and one migratory breeder species (3%). However, some species have two different statuses, may be due to the existence of two distinct populations that use the site. The family of Anatidae is the most represented in terms of richness and numbers by ten species and a maximum exceeding 8000 individuals was marked during January and February 2008 with all species combined. Other families are poorly represented, except that of Scolopacidae with nine species after that of Anatidae.

For some breeding species, their breeding was confirmed as: Ruddy Shelduck *Tadorna ferruginea* that was never reported in the Chott. This species was previously observed in winter by Jacob & Jacob (1980) at neighbor site (Lake of Boughzoul) with a small number (Ledant 1981, Jacob & Jacob, 1980). Among all recorded species, eleven species are protected under Algerian law pursuant to Decree N^o. 83-509 of August 20, 1983 and the Order of January 15, 1995 completing the list of non-domestic protected animal species, Marbled Teal *Marmaronetta angustirostris* species of greatest conservation listed as Endangered Species in the category (VU) of Red List by International Union for Conservation of Nature (BirdLife International 2004). The latter species is present with a relatively high number (88 individuals) November 9, 2008; it has never previously been cited in the Chott El-Hodna. Indeed, it is important to note that attendance of this ecosystem by aquatic birds depends mainly on its impoundment. At the end of the study, the Chott El-Hodna one hand seems to play a great role in the wintering and breeding of waterfowl and also serve as stopover site for migrant species during their trans-Saharan migration journeys.

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