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Diurnal time budget of wintering Pochard *Aythya ferina* (Anatidae) at Lac des Oiseaux (Ramsar site, Northeast Algeria)

Hacina Saidi, Souad Dadci, Ali Tahar and Moussa Houhamdi

Abstract

The present study was conducted to study the diurnal behavior of the Common Pochard *Aythya ferina* during two consecutive wintering seasons (between September- May 2013/2014 and between September-May 2014/2015) at Lac des Oiseaux. Individuals of *Aythya ferina* arrive at Lac des Oiseaux from early September. The number of individuals fluctuates temporally between 200 and 500 individuals with an average of 350 individuals. *A. ferina* generally occupies the central regions of the lake near the *Scirpus lacustris* and away from human disturbance. The diurnal behavior of the species has shown that Lac des Oiseaux was used as field daytime foraging (feeding was 52%). This activity was followed by swimming 21%, preening 15%, sleeping 10% and finally flying 2%

Keywords: Anatidae, *Aythya ferina*, wetlands, wintering, North Africa, conservation

1. Introduction

Birds are distributed in water body area in specific ways. This distribution responds to biological and ecological criteria that characterize both species and site [4]. The abundance and availability of food resources and the risk of predation are considered the main forces that determine how birds use their habitat and if they will live solitarily or socially [19].

The amount of time allocated to various behaviours is paramount to understand the ecological needs of a species. Daily activity and behaviour often vary among species; these activity patterns help us to understand the ecological adaptations of birds. The Common Pochard was the most regular species of Lac des Oiseaux [7-9]. In the Mediterranean, this Anatidae usually frequent two different sites during the winter, resting places during the day and foraging grounds during the nights [11]. Daytime resting places are usually poor, salty but offer high safety while foraging grounds are usually rich of food resources [22].

In the study, we plan to follow the evolution of the numbers of the Common Pochard during two wintering season, then to monitor the diurnal time budget of this water bird in order to determine its wintering strategy at Lac des Oiseaux (northeast of Algeria).

2. Material and Methods

Data about ecology and time budget of this Anatidae were collected at Lac des Oiseaux (Northeastern Algeria), a shallow freshwater lake of 75ha dominated by Narrow-leaf Cattail *Typha angustifolia* and Bulrush *Scirpus lacustris*. The study site is part of the eastern Numidian wetland complex, which holds three Ramsar sites, Lac des Oiseaux, Lac Tonga and Lac Oubeira, as well as a variety of marshes, dune slacks and seasonal ponds.

During the study period the lake had not yet become a protected area but hunting was rare, in contrast to the neighbouring Mekhada marsh, where hunting pressure was relatively strong.

Weekly observations were made from September 2013 to May 2015 through a 20x60 telescope and a pair of 10x50 binoculars. Individual counts were carried out whenever the total number of Pochards was fewer than 200. When this number exceeded, an estimate of the population size was achieved by dividing the flock into small equal parts and through extrapolation.

The spatial distribution was recorded on a map and the birds' time budget (October-April) was monitored from 0700h to 0930h and from 12 noon to 1430h. These two periods were assumed to be representative of a full day, although Campredon (1981) has shown that Pochards may, at

times, display an uneven pattern of diurnal behaviour. A randomly selected focal duck [1] was followed for 10 minutes and its behaviour divided arbitrarily into five activities: feeding, swimming, preening, sleeping and flying. Additional observations were carried out at dawn and dusk to record the

duck's movements between Lac des Oiseaux and any other adjacent wetland. A total of 45 hours were devoted to these latter observations at each site. Hunting was relatively frequent throughout the study period at both sites.

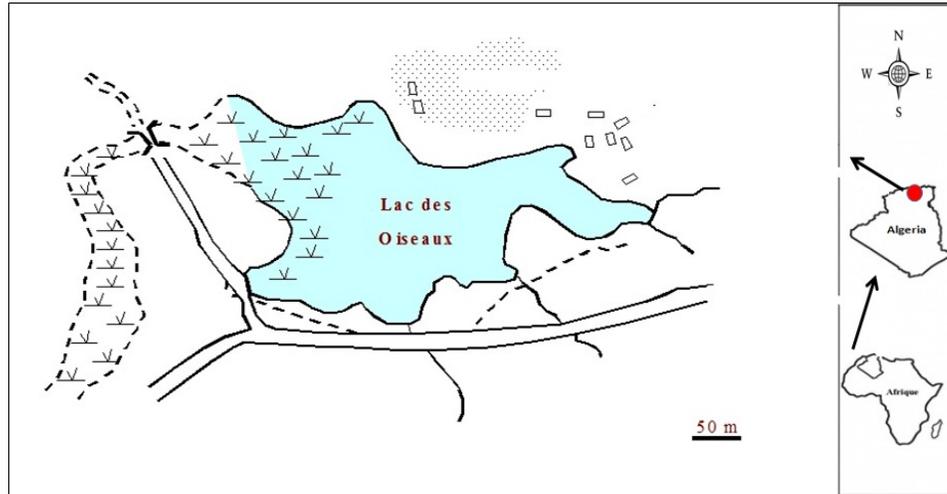


Fig 1: Location map of Lac des Oiseaux.

3. Results and Discussion

3.1 Phenology and spatial occupation

Individuals arrive at Lac des Oiseaux from early September. Numbers increase gradually to 500 individuals during November (Fig.2). Then, progressive decreases was observed until the mid-April. Overall, like the most of wintering Anatidae in Algeria, the evolution of numbers show a single peak often observed during the migration period postnuptial of all water birds crossing the Mediterranean [15, 16]. Indeed, during November the present study observed the last winter visitors which often frequent in other wetlands (in the high Plateaux and the Sahara) providing more tranquillity to waterfowl [9, 10, 2, 21].

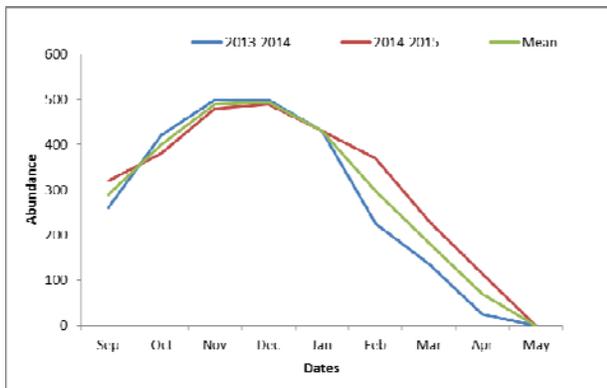


Fig 2: Temporal evolution of wintering Pochards number at Lac des Oiseaux.

Individuals were mainly observed near other Anatidae in the central sector of the water (in the deepest regions) away from

the human disturbances (Fig.3).



Fig 3: Spatial distribution of wintering Pochards at Lac des Oiseaux.

2.2 Diurnal behaviour

The monitoring of diurnal activity rhythms of the Common Pochard immediately upon the occupation of Lac des Oiseaux towards the end of their migration, (210 hours over two consecutive seasons), shows that feeding was the most important behaviours (52%).It is followed by swimming 21%, preening 15%, sleeping 10% and finally the flying 2% (Figure 3).

Feeding was observed with 48% at the beginning of the study and then gradually increases. It displayed the highest value during May (Fig.5). These Pochards *A. ferina* showed an intense daytime feeding activity from the beginning of their arrival at the site.

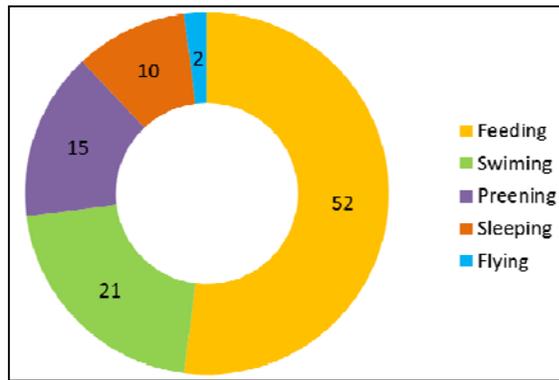


Fig 4: Diurnal time budget of wintering Pochards at Lac des Oiseaux.

The increase in the level of feeding at the end of the study showed a preparation of birds to return to their nesting sites (spring migration) [12-14].

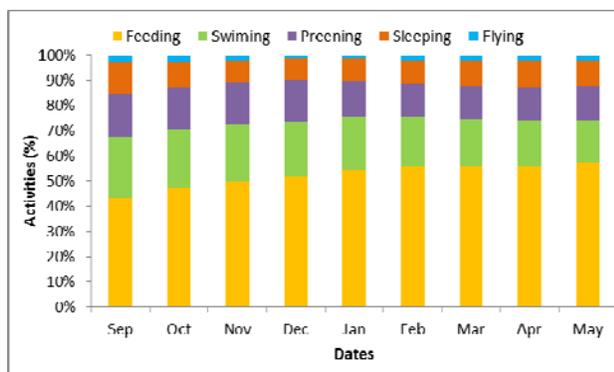


Fig 5: Temporal evolution of diurnal time budget of wintering Pochards at Lac des Oiseaux.

The highest values of swimming were observed at the beginning of the study, and then the values decreased gradually until May (Fig.5). For the Common Pochard feeding and swimming were often associated, because individuals feed while swimming [6, 5]. Swimming was much observed in single individual. Preening was observed throughout the whole wintering period with an average rate of 15%. Its rates vary between 12 and 19% and the maximum values were recorded during the start of the study (Fig. 5). Among the birds that come across the Mediterranean, preening was often a primary activity [8]. During the wintering season the preening activity decreased to achieve their lowest values towards the end of the wintering season (12%). Sleeping that holds a small part of rhythms activity of Pochards (10%) begins with the high values (14%) and then gradually decreases until February and then increases again late in the season (Fig.5). Sleeping activity was observed in birds gathered in large groups. Sleeping was considered as a daytime resting phase and simultaneously allows the group to rebuilding their energy reserves [12-14]. Flying occurs after human disturbance or by Harriers. The Pochards showed a very shy feature [17].

4. Conclusion

Overall, Pochards *Aythya ferina* display a constant feeding activity which dominates the assessment of daytime activities and becoming increasingly greater toward the end of the season. This activity was associated with the diver character of this species. Swimming holds the second part. Preening

and sleeping was observed from the beginning of the study. Flying after human disturbance was noted during the end of the season. Thus, the present study concludes that the Lac des Oiseaux acts as a foraging ground for Pochards *Aythya ferina*.

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