

Research Article

Population sizes and migration times of the White-headed Duck, *Oxyura leucocephala* (Scopoli, 1769), in Turkey

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Abstract

A study on migration times and population sizes of the white-headed duck (*Oxyura leucocephala*), which is one of Europe's rarest birds, was conducted between January 2007 and August 2010 at Lake Burdur, the Lake Van Basin (Lake Erçek, Lake Sodalı (Arin), Lake Norşin) and the Sultan Marshes in Turkey. It was determined that the reason for the species to prefer Lake Burdur as a wintering area was the lack of dense reeds at the share of the lake and not freeze completely. The results of our study showed that the maximum individual number was 1220 and an increase in the ratio of adult male during the last years was observed at Lake Burdur. Especially in the recent years, the species was not observed in the Sultan Marshes, because of the habitat degradation. The breeding period was about seven month (April-October) in the Lake Van Basin. During this period it was determined that the species prefers to breed in habitats that have tall and dense reed beds (*Phragmites* spp. and *Typha* spp.) and which are far from human effects, providing shelter against wind and precipitation.

Keywords: White-headed Duck, *Oxyura leucocephala*, distribution, range, Turkey.

1. Introduction

The white-headed Duck *Oxyura leucocephala* (Scopoli 1769) is the only waterfowl of the genus *Oxyura* native to the Palearctic region. The species exhibits a very fragmented distribution (Hughes et al. 2006). Although the divisions between the biogeographic ranges of White-headed Duck populations are largely unknown, in principle, four populations can be distinguished. The western populations are characterised by their sedentary nature whereas the eastern populations are migratory, moving in latitude from the cold season to the warm season (Essetti & Benaissa 1996; Scott & Rose 1996; Dimitrov et al. 2000; Green & Hughes 2001; Robinson & Hughes 2006).

Turkey provides the habitat for White-headed Duck to winter and breed with many other bird species as well. 70% of the global population of the species winters in Lake Burdur (Anstey 1989; Green et al. 1996; Buckley et al. 1998).

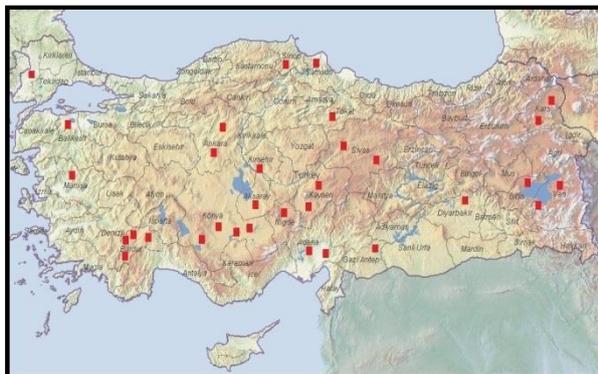


Figure 1. Distribution of the White-headed duck, *Oxyura leucocephala*, in Turkey

Furthermore, 10% of the current population incubates in the wetlands of Central and Eastern Anatolia (Kumerloeve 1961; Ayvaz 1984; Kirwan 1994; Yazar & Magnin 1997; Eken 1998; Albayrak & Erdoğan 2002; Albayrak et al. 2002). Additionally, the white-headed duck is a scarce migrant for south-eastern Anatolia (Biricik & Karakaş 2011). Geographical distribution of the White-headed Duck in Turkey is shown in Figure 1.

In this study we aimed to establish the distribution of the White-headed duck in the study areas and to identify possible causes of the decline in wintering numbers. We also evaluated threat factors affecting the distribution of the population.

2. Material and Method

This study was performed between January 2007 and August 2010 in the Burdur Lake, the Lake Van Basin and the Sultan Marshes. These areas were chosen by considering the habitat preferences of the species. Researches about the species were carried out at observation stations designated in the study areas. Stations were established based on population density, nest sites, food availability, predator pressure, suitability for observation, intensification of anthropologic pressure and wetland accession (by boat) to monitor breeding data. The Point counts and Line Transect methods were used for a quantitative assessment of the population. To get accurate values about population density, photographs of large groups were used for census. The large groups were counted by dividing the photographs taken in the field into squares.

For determining the population density, monthly observations from the breeding to the non breeding

season were conducted. All data were pooled for a 3-year period, together with the mean counts of each year.

3. Results and Discussion

The results of previous studies about the species and our findings greatly complement each other. However, when the habitat preferences of the species and the migration time when compared with these data, some differences were revealed. The first flocks of the White-headed Duck usually arrive in Lake Burdur in the second half of September. During the next months the population increases slowly and reaches its maximum in February. Rarely, this can be observed earlier. The values as well as the minimum and maximum counts about the population sizes of the White-headed Duck are given in Table 1.

Table 1. Quantitative assessment of white-headed duck populations in the study areas in 2007-2010.

Years	N	Burdur Lake	Erçek Lake	Arin Lake	Norşin Lake
2007	male	473	8	394	18
	female+duckling	402	16	281	30
	Total	875	18	675	46
2008	male	415	8	346	14
	female+duckling	357	15	189	37
	Total	750	18	535	49
2009	male	637	18	235	21
	female+duckling	583	35	158	56
	Total	1220	29	393	58
2010	male	511	14	65	15
	female+duckling	419	15	38	20
	Total	930	22	103	26

N: number of individuals. The table gives the maximum number of birds counted.

During the winter of 2007, 875 individuals, of which 473 were males, were recorded in Lake Burdur. In this period, the male individual number ratio to the sum of females and ducklings was 54%. A small group of 8 to 10 individuals did not leave the area and spent the summer there. During the winter of 2008, 750 individuals, of which 415 were males, were recorded. In this period, the male individual number ratio to the sum of females and ducklings was 55%. During the winter of 2009, 1220 individuals, of which 637 were males, were recorded. In this period, the male individual number ratio to the sum of females and ducklings was 52%.

In the first half of March, they leave Lake Burdur. No significant difference between years have been observed concerning migration times. Ivanov & Jankov (2001) inquired whether the migrating populations were affected by weather or not, and determined that during extremely cold winters, individuals arrive at the wintering area early and leave it late (late march). Jenkins & Watson (2000), found that recent climate changes force species to leave the wintering places earlier and reach breeding grounds ahead of time. Our findings complement these data. In Lake Burdur, individuals leaving the area early in 2007 are apparent examples of this. Additionally, we consider the possibility that differences observed during migration times were a result of climatic factors in the area.

We determined that the species prefer Lake Burdur as a wintering area because it does not freeze in winter. Lack of dense reed beds on the shore and undeveloped flora, which is a result of high concentration of soda and salt, allow the species to control its surroundings easily.

It was determined that the Şeker Beach located on the southern shore is the most preferred place during the day. However, Tabur (2002) reported that the populations were concentrated at the northern parts of the lake-relatively free of pollution. Green et al. (1996) indicated that more than 70% of individuals congregated between Senir and Karakent, and they preferred the southern regions. Kiziroğlu et al. (1995) stated that the number of species increased between 1969 and 1991 and that they were not affected by pollution. So, we believe that this change of habitat preference could be originated from anthropogenic pressures, which intensified in northern parts of the lake and noise pollution (especially airport).

Handrinos (1998), stated that the increase in individual numbers wintering in Greece may be related to the decrease at Lake Burdur. Panayotopoulou & Green (2000), determined that the number of individuals wintering in Romania, Bulgaria, Greece and Azerbaijan have increased to 800-2500 in recent years. Li et al. (2006), states that the number of wintering individuals reached 520 in Romania, 1970 in Bulgaria and 1472 in Greece. Appropriately, it was supposed that a large number of individuals that previously wintered in Lake Burdur, changed their migration route to the Greece, Bulgaria and Romania. Furthermore, numerical changes in individual numbers throughout the years are thought to be the reason for species' changing their wintering grounds because of the environmental factors.

Adult male ratio was determined as 54% in 2007, 55% in 2008 and 52% in 2009. Green et al. (1996) determined that this ratio was 40% in 1991 and 49% in 1993. They pointed out that an increase in adult male ratio was the result of a decrease in incubation success and duckling numbers. The fact that the individual numbers in the area decreased significantly and the number of adult males increased show that our study results are correlated. That means population reduction tendency continues in Lake Burdur.

Mean adult numbers were observed to be 29 at Lake Erçek, 37 at Lake Norşin and 72 at Lake Arin. Adizel (1998) recorded 3 individuals at Lake Norşin and 300 at Lake Arin. Eken et al. (2006) reported the maximum individual numbers as 18-39 at Lake Erçek, 50-60 at Lake Arin and 4-8 at Kavuşuk Peninsula, which includes Lake Norşin. When our findings are compared with numbers provided by the authors, an increase in individual numbers is apparent. All individuals gathering in Lake Arin do not use the area for incubation. Some of these individuals disperse to other breeding grounds in the basin. It is thought that individuals gathering in the area could have come from their breeding grounds in Iran and not just from the surrounding lakes. This clearly shows the importance of the area for this species.

In the course of our observations we determined that the most significant threats the species face in their habitat of wetlands are habitat destruction, illegal hunting, anthropogenic effects, climate changes, water level changes and pollution. Breeding grounds in the Lake Van Basin (Erçek, Arin and Norşin Lakes) have no protection status. Hunting is prevalent in the region. Breeding grounds in the Lake Van Basin urgently need a legal protection status and a wetland managing plan. Considering the ornithological wealth of the basin, ecotourism should be encouraged.

Because of an extreme drought in the Sultan Marshes we could not make any observations about the white-headed duck. The most important reason for the water shortage in the Sultan Marshes is the diversion of water sources for irrigation. With the Zamanti Regulator, whose construction started in 1992, and a derivation tunnel, the irrigation problems of the region are planned to be solved and water supply of the Sultan Marshes will be replenished, thus protecting the ecological balance. Once the Project is complete, River Zamanti's water will be delivered to the basin. It will be a major step for solving the region's water problem. In order to protect biodiversity, agriculture and irrigation policies should be rearranged. Canals feeding the reed beds should be completely open.

White headed duck is an important species because of its place in the ecosystem and it is a globally endangered species wintering and breeding in our country. To prevent further damage to the population, their wetland habitats must be protected and hunting should be prevented.

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