

On the status and distribution of the Ferruginous Duck *Aythya nyroca* in Southeast Anatolia, Turkey

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Abstract. The Ferruginous Duck (*Aythya nyroca*) is globally threatened duck species, and in Turkey the population is in decline. Records of the species were obtained during field excursions carried out in different localities of Southeast Anatolia between 1998 and 2015. These data were evaluated to gain a clearer understanding about the local status of the species. Five areas arose as possible breeding sites, while Karkamış Dam is the most significant wetland both for breeding and the wintering of the species. The main threats are the alteration of wetlands, reed destruction, illegal hunting, and aquatic pollution.

Key words: Ferruginous duck, *Aythya nyroca*, South-eastern Anatolia, Turkey.

The Ferruginous Duck *Aythya nyroca* (Güldenstädt, 1770) has been reported regularly in 77 countries and in 26 countries as a vagrant (Robinson & Hughes 2006). The species breeds regularly in the Black Sea and Caspian Sea regions, northern Africa, the coastal Mediterranean and West Africa, as well as in Central and Eastern Europe, and winters in Eastern Africa and in the Arabian Peninsula (Scott & Rose 1996). Moreover, significant numbers of birds have been reported in Bangladesh, Azerbaijan, Turkmenistan, Kazakhstan, Uzbekistan, Sudan, Egypt and Mali during the winter season (Robinson & Hughes 2003,2006).

The global population of the Ferruginous Duck has been given as 163,000-257,000 individuals (Robinson & Hughes 2003,2006). The size of the breeding population in Europe has been estimated as 12,000-18,000 pairs (Birdlife 2015a), which was recently updated as 17,400-30,100 pairs (Birdlife 2015b). During recent decades, the estimated breeding population of the Ferruginous Duck in Turkey has decreased from 1,000-3,000 pairs in the 1990s (Kasperek & Bilgin 1996) to 800-1,200 pairs in 2001 (Birdlife 2004) and to 482-760 pairs in 2013 (Birdlife 2015c). The size of the species' wintering population in Turkey was estimated to be 1000-1500 individuals in 2002 (Birdlife 2004) and was recently low as 17-569 individuals for the 2002-2012 period (Birdlife 2015c).

The decline of the Ferruginous Duck population throughout its range is mainly due to habitat degradation and the loss of wetland habitats. Owing to a serious decrease in the last quarter of the twentieth century, the species has been noted as a globally threatened species and classified as "Near Threatened" by the IUCN (Birdlife 2015a), although it was noted to be in the "Least Concern" category for Europe (Birdlife 2015b). The major threats in many parts of the Palearctic are the loss of suitable habitats, due to the intensification of agricultural activities, and illegal hunting, as well as a particular sensitivity of the species to toxic wastes in water (Lebedeva 1999). It has also been reported that the Ferruginous Duck occupies nesting areas at a later time than other waterfowls, and as a result sometimes has to tolerate suboptimal nesting sites, which causes a decrease in reproduction success (Lebedeva & Markitan 2001).

The species was revealed to be local and uncommon in all regions of the country, with smaller numbers in the east, and very local in Thrace and Southeast Anatolia (Kasperek &

Bilgin 1996, Kirwan 1997, Kirwan et al. 2003), and as a breeder in almost all freshwater lakes (Özen & Kurt 2001). Little information is currently available on the status, distribution and ecology of the species in Turkey (Green1998), which is particularly the case for Southeast Anatolia, apart from a few studies conducted in this region that have focused on the local avifauna (e.g. Biricik 1996, Karakaş & Kılıç 2002, 2005, Biricik & Karakaş 2012). Kirwan et al. (2008) have stated the species to be "rather local and uncommon summer migrant, breeding in wetlands in all regions except Southeast Anatolia, where three possible breeding localities were identified during recent fieldwork", however, no information on the suspected localities has been specified.

Reliable information on the breeding and wintering populations, as well as the habitat requirements of the species, are still lacking, and these are essential for effective conservation. The aim of this report, to share the results of our observations of the Ferruginous Duck in the wetlands of South Eastern Turkey over several years and throughout the seasons, and to discuss possible threats.

The material mainly comprises our observation data of the Ferruginous Duck from 1998 to recent. Several parts of Southeast Anatolia (Fig. 1) have been surveyed in various seasons by the standard ornithological methodology (Mullarney et al. 1999) using binoculars (10 × 50), telescopes (20-60 × 60) and a hand GPS. Most of the observations were performed during the midwinter waterfowl censuses. Both large and small scale wetlands (dam reservoirs, lakes, ponds, etc.) including the temporary ones were investigated. Observations from May to July were regarded as the breeding season records, while December to February as the wintering records.

Alongside of our own data obtained during irregular yet quite frequent ornithological trips, we combined observation reports from other sources, including published reports and unpublished data of the Turkish databank for bird observations (www.kusbank.org).

Records obtained at several wetlands in Southeast Anatolia during the study period have been summarized in Table 1.

Though no direct detection of any reproduction is available, an evaluation of presence periods as well as habitat suitability reveals that the Ferruginous Duck possibly breeds in five spots of the study area, nonetheless, in small numbers (Table 1).

Midwinter waterfowl censuses (MWC) conducted during the last decade in Turkey indicated a reasonable impor-

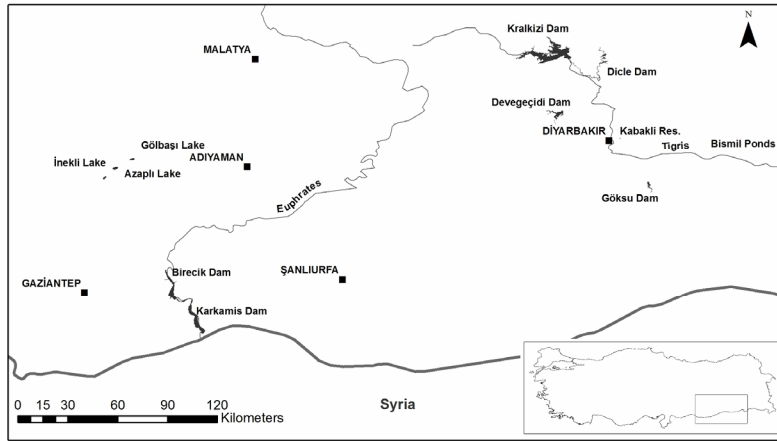


Figure 1. The map of the Southeast Anatolia showing particular wetlands mentioned in the text.

Table 1. Observations of Ferruginous Duck *Aythya nyroca* in South Eastern Anatolian wetlands between 1998 and 2015.

Area*	Maximum numbers in distinct periods**				Source
	Br	PBr / M	W	M	
Karkamış Dam (Şanlıurfa / Gaziantep)	25 (11-14)	12 (08-12)	651 (02-13)	4 (07-13)	Own data, and Kusbank (2015)
Birecik Dam (Şanlıurfa / Gaziantep)	-	12 (11-12)	52 (04-15)	9 (12-14)	Own data, and Kusbank (2015)
İnekli Lake (Adiyaman)	21 (05)	-	3 (03)	-	Own data
Azaplı Lake (Adiyaman)	-	-	1 (05)	-	Own data
Bismil ponds (Diyarbakır)	8 (03-15)	22 (03-12)	35 (03-11)	11 (03-13)	Own data
Devegeçidi Dam (Diyarbakır)	60 (98)	80 (98)	-	53 (98)	Kılıç (2013)
Kralkızı Dam (Diyarbakır)	4 (00)	6 (00-01)	-	-	Karakaş & Kılıç (2005)
Gökusu Dam (Diyarbakır)	-	-	42 (98-99)	-	Karakaş & Kılıç (2002)
Dicle Dam (Diyarbakır)	-	-	-	28 (00)	Own data

* Provinces are given in brackets.

** Abbreviations stand for: Br, Breeding (May-Jul); PBr, Post breeding (Aug-Sep); M, Migrating (Oct-Nov and Mar-Apr), W, Wintering (Dec-Feb). Statuses are only estimations, rather than exact documentations, largely attributed to observation time of the year. Years of available observations are given in brackets. -, No data.

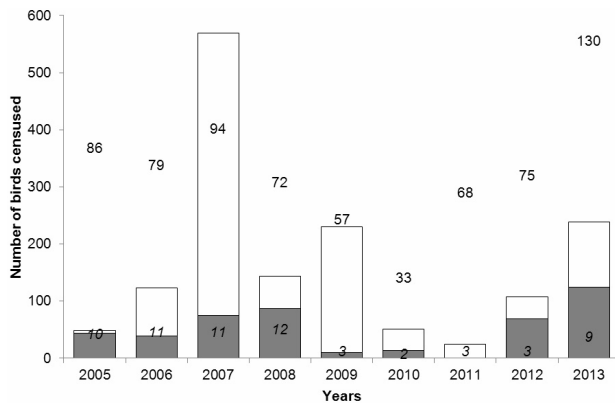


Figure 2. Comparison of national and regional midwinter waterfowl census results for the Ferruginous Duck. Open and shaded bars show the numbers of censused individuals of the species in Turkey and in the region, respectively. Regular and italic numbers in comparative positions indicate the numbers of wetland areas censused overall in Turkey and in South Eastern Anatolian region, respectively.

tance of the Southeast Anatolian wetlands, though the deficiency of available data (Fig. 2).

Among the studied wetlands, the reservoir area of Karkamış Dam seems to have a major importance for the species in South Eastern Turkey. The Inekli Lake also appears to be a significant natural wetland for both breeding and wintering of the species, not alike of the lakes of Azaplı

and Gölbaşı, which are located in its close neighbourhood and have similarities in their physical properties.

In Diyarbakır province, where the majority of observations originate, natural ponds in Bismil area hold suitable habitats for breeding of the species, where a total of 105 individuals were observed during the study period, and up to four pairs presumably breed at least in wet years.

Birds were usually observed in particular at shallow (not deeper than 1 m) waters with dense vegetation (e.g. at the front of dike at Kralkızı Dam, and in Bismil ponds). In contrast, a flock of four birds were in open surface of sewage pools for at least three consecutive days during their spring migration.

According to Kasperek (1992), the species is a very local breeder in all regions of Turkey apart from Southeast Anatolia. Kirwan (1997) made a comprehensive evaluation of the historical records in Turkey and proposed a breeding and winter distribution pattern, stating that no breeding locality was identified in Southeast Anatolia. Despite this, Welch (2004) considered three areas, e.g. Karkamış Dam and Inekli and Azaplı lakes (see Fig. 1), as probable breeding locations, and Devegeçidi Dam as a possible nesting site for the species. Eken et al. (2006) revealed Inekli, Azaplı and Gölbaşı lakes and Devegeçidi Dam both as Important Bird Areas and Key Biodiversity Areas, based on, breeding records of the Ferruginous Duck (5-10 pairs) during 2001 and 2002, as well as other factors. Although a large number of individuals were detected during at least one breeding season (in 1998)

at Devegeçidi Dam area (Kılıç 2013; see Table 1), we have tended to assess the area not to be as remarkable as the other sites mentioned, owing to the scarcity of suitable areas for nesting, at least at the present time.

Our results suggest that the species has a patchy distribution in the study area, and possible breeding areas are very limited, as well as under threat. All wetlands in the region face the shared problems of habitat loss or degradation because of numerous alteration projects, irrigation caused by intensive agriculture, drying of wetlands in order to gain land, reed burning, illegal hunting, and pollution. In addition, disturbance prompted by human activities such as fishing and farming around wetlands should be considered as noteworthy, especially during the breeding season when birds are more sensitive.

Temporary wetlands may be vital for the species that relies on that habitat in arid regions (Fouzari et al 2015). Natural ponds are scarce in the study region; although they are small in size and they dry out completely in some years, due to inadequate precipitation, they play a crucial role for wildlife as the region has a relatively dry climatic character. Shallow waters typically surrounded by emergent vegetation, such as reed, offer safe nesting places for many waterfowl including the Ferruginous Duck (Cherkaoui et al. 2016). The Bismil area, where a number of natural ponds occur (Biricik et al. 2010, Karakaş 2010), is intensively used for agriculture (Kılıç & Eken 2004), being under threat due to the extensive use of pesticides and fertilizers, which is considered responsible for the reduced breeding success of water birds (Lebedeva & Markitan 2001). The loss of wetland habitats, along with intensive agricultural activities and its aftereffects, were also considered as the most significant factors for the decline of many bird species in many countries (Kirwan 1997, Robinson & Callaghan 2003).

On the other hand, although the Ferruginous Duck is a globally threatened species in many countries, illegal hunting is still a serious problem in Mediterranean countries, including Turkey (Robinson & Callaghan 2003, Brochet et al. 2016), which is also relevant for the study area.

There is still no reliable information on the wintering population size of the species in Turkey. Estimated numbers have fluctuated since 2002 between a few dozen and 1,500 individuals (Birdlife 2004, 2015c). The results of MWC performed during the last decade (Çağlayan et al. 2005, Suseven et al. 2006, Onmuş 2007, Akarsu & Balkız 2010, Erciyas Yavuz & Kartal 2011, Erciyas Yavuz & İsfendiyaroğlu 2012, Erciyas Yavuz & Boyla 2013) do not give a clear picture (see Fig. 2). A maximum of 569 individuals have been censused in 2007 in a total of 94 surveyed wetlands, while just 25 have been recorded in 2011 in 68 areas throughout Turkey; the correlation between the numbers of the censused areas and observed birds is calculated as 0.42. An analysis of the row data gained by MWC gives similar results for the studied region as well: 124 birds were maximally recorded during MWC in regional wetlands, and the numbers of areas and observed birds correlate as about 0.60. On the other hand, it should be stated that a sizeable number of 651 Ferruginous Ducks which were reported in winter 2009 from Karkamış Dam (see Table 1), was not evaluated in the respective MWC report (Akarsu & Balkız 2010). This could either be because the observation was out of the standard process of the

MWC, or the number was incorrect. The reason for the region being preferred as a wintering area by the species could to some extent be due to its geographical position, which is situated at a relatively low latitude, and has milder climate, thereby allowing suitable sheltering opportunities for the Ferruginous Duck.

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