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Population status and distribution of three swan species (*Cygnus* sp.) in Turkey

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Abstract

In the study, population size, status and distribution in Turkey of three swan species (*Cygnus olor*, *Cygnus cygnus*, *Cygnus columbianus*) was evaluated. Observations were carried out in different wetlands over Turkey by authors between 2009 – 2019 and observation records at the open access database, reports and publications between the years 1945 and 2021 were scanned to investigate population size, status and distribution of three swan species in Turkey. As a result, it was determined that swan species winter over Thrace, Region of lakes and the coast of Black Sea in Turkey regularly and in high number of individuals. They winter irregularly with low number in the other observation location. *Cygnus olor* in 67, *Cygnus cygnus* in 46, *Cygnus columbianus* in 26 different locations were observed between 1945-2021. Thrace Region had the largest wintering and breeding population. According to the results of the study, wintering population of the species fluctuate in years. The highest wintering population of three species was recorded about 13 000 individuals in 2010 in Meriç Delta. Only Mute swan (*Cygnus olor*) was resident and bred irregularly in three different areas with 10 pairs. Whooper swan (*Cygnus cygnus*) was a winter visitor spend the spring irregularly in 2 different locations. Tundra Swan (*Cygnus columbianus*) was observed in winter season and especially in the mid-winter.

Keywords: Population, swan, status, Turkey

Üç Kuğu türünün (*Cygnus* sp.) Türkiye'deki popülasyon durumu ve yayılışları

Özet

Çalışmada Türkiye'deki üç Kuğu türünün (*Cygnus olor*, *Cygnus cygnus*, *Cygnus columbianus*), popülasyon büyüklüğü, statüsü ve dağılımı değerlendirilmiştir. Gözlemler yazarlar tarafından 2009-2019 yılları arasında üç farklı sulak alanda gerçekleştirilmiş ve açık erişim tabanlarında 1945-2021 yılları arasındaki raporlar ve yayınlar üç Kuğu türü için taranmıştır. Çalışmada kış sezonu boyunca, Kuğu türlerinin Trakya, Göller Bölgesi ve Karadeniz'de, düzenli ve yüksek sayılarda yayılışı olduğu tespit edilmiştir. Diğer gözlem lokasyonlarında düzensiz ve düşük sayılarda görülmüşlerdir. 1945-2021 yılları arasında Kuğu (*Cygnus olor*) 67, Ötücü kuğu (*Cygnus cygnus*) 46 ve Küçük kuğu ise 26 farklı lokasyonda görülmüştür. Bu lokasyonlardan Trakya Bölgesi en büyük kışlama ve üreme popülasyonuna sahiptir. Çalışmanın sonuçlarına göre, türlerin kışlama popülasyonları dalgalanma göstermektedir. Üç en kalabalık kışlama popülasyonu 13000 bireyle 2010 yılında Meriç Deltasında kaydedilmiştir. Üç türden yalnızca Kuğu (*Cygnus olor*) yerlidir ve üç farklı alanda 10 çift ile üremektedir. Ötücü kuğu (*Cygnus cygnus*) kış ziyaretçisidir ve iki farklı alanda baharda düzensiz olarak görüşmüştür. Küçük kuğu (*Cygnus columbianus*) ise özellikle kış ortasında daha çok olmak üzere kışın gözlenmiştir.

Anahtar Kelimeler: Popülasyon, kuğu, yayılış, Türkiye

1. INTRODUCTION

Turkey's avifaunistic diversity is almost equal to Continental Europe's (Turan and Arıkan 2010). Number of the bird species were given as 502 (Kiziroğlu 2008) and 453 (Kirwan et al. 1998) in different references. Three of the four swan species in Western palearctic; Mute swan (*Cygnus olor*), Whooper swan (*Cygnus cygnus*) and Tundra swan (*Cygnus columbianus*) are

observed in Turkey. There are no publications and studies about the population size, status and distribution of swan species in Turkey. Evaluations about population size in global and local scale distribution, population size and statuses are as the following;

1.1. Mute swan (*Cygnus olor*)

Global population estimated to number approximately of the Mute swan which is in LC category according to IUCN (2022) red list criteria is between 598 000-615 000 and 83 400-11 6000 pairs for Europe (BirdLife Int. 2022). According to Wetlands International (2012), Mute swan have 7 population worldwide. Turkey is in Black Sea population. Estimated size of Black Sea population is between 59 000-80 000 pairs and it is also presumed that the population is increasing (Wetlands Int. 2022). Although distribution areas and population sizes of the species in Turkey are not known, the highest number individuals have been observed in Meriç Delta which is a wetland (Arıkan and Turan 2010). Despite the fact that the information about the breeding of the species in Turkey is not certain yet, it is in local status.

1.2. Whooper swan (*Cygnus cygnus*)

The global population of the Whooper Swan which is in LC category according to IUCN (2022) red list criteria is estimated to number > c.180 000 and between 25 300-32 800 pairs for Europe (Birdlife Int. 2022). Whooper Swan have 5 main populations. Turkey is in Black Sea - East Mediterranean population (Wetlands Int. 2012). It is presumed that size of this population is 14.000 individuals and it shows decrease (Wetlands Int. 2022).

1.3. Tundra swan (*Cygnus columbianus*)

Despite the existence of Tundra Swan was a matter of debate in the past, nowadays they can be observed in many areas in winter season in Turkey (Arıkan, Turan 2011). Although the global population is estimated to number 317 000-336 000 individuals (Wetlands Int. 2016) tundra swan which is in LC category according to IUCN red list criteria, Europe population which is in VU category according to IUCN red list criteria decrease and estimated to number between 5000-6000 pairs. First record of Tundra Swan in Turkey was kept in 1983 (Kirwan et.al. 2003). However, according to Wetlands International (2022) the one distributes in Turkey is *Cygnus columbianus bewickii* which is the subspecies of *Cygnus columbianus*. This subspecies has breeding population in North-west Europe and wintering population in Caucasia. It is estimated that the size of breeding population is 20 000 and the size of wintering population is 1 000 individuals. Turkey is in the Caucasia winter population (Wetlands Int. 2022).

The aim of the study to determine the population size, status, distribution, breeding and wintering areas of three swan species observed in Turkey using ornithological observations and contemporary literature survey.

2. METHOD

In the extent of the study, 70 thesis and publications on birds of Turkey, which have been published so far, was investigated. Observation reports and records published between the years 1945 and 2012 was checked and observation data from amateur bird watching groups made use of (Kuşbank 2022). Besides, ornithological surveys were carried out between 2009 and 2019 in six different wetlands. Both ornithological and literature surveys were used.

Data obtained from the study was visualized by using the software programmes Intergraph Geomedia 6.1 and Map Maker 3.0. In the study the map of Turkey was divided into 50x50 km

squares and records were turned into a map. In the maps; wintering, breeding and summer (non-breeding population) population range was shown with average population sizes.

3. RESULTS

1 326 observations related to three swan species were carried out by authors and other birdwatcher-ornithologist between 2009 and 2019 (Table 1). When the former studies were added to the results, it was found out that observations were carried out in 87 different locations. Observation records and number of individuals of every species vary in years and when arithmetic mean of number of individuals in years checked, it was found that population sizes were similar to a large extent.

Table 1. Number of the ornithological observations about swans between 2009 and 2019

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Authors	15	10	18	16	15	14	12	10	8	18	13	149
Others (Resident)	47	36	20	55	157	25	143	89	76	42	173	863
Other (Foreigner)	15	24	31	20	47	39	12	35	42	40	9	314
Total	77	70	69	91	219	78	167	134	126	100	195	1326

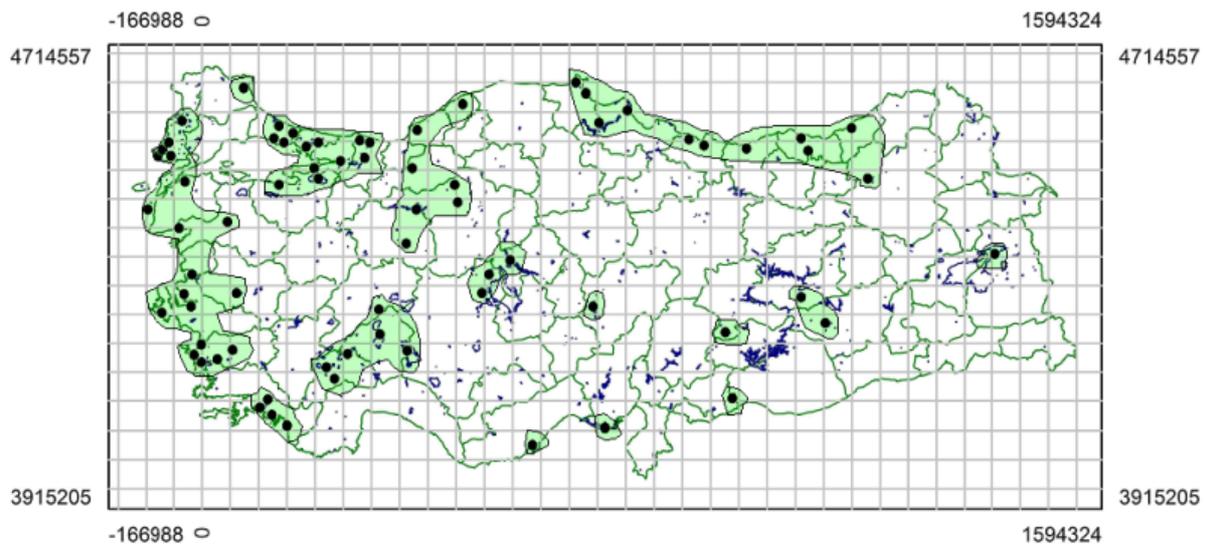


Figure 1. Observation location of Mute swan over Turkey.

3.1. Mute swan (*Cygnus olor*)

Mute swans was observed in 67 different areas. Besides having the highest population in Turkey, Swan is the most common swan species. Number of the individuals varies in years. The utmost bird count has been done so far was carried out in January in 2010 in Meriç Delta and 11 200 individuals were counted. Within the observations carried out in the last twenty years, population size maximizes in January. Average population size of this species is 5 507 individuals in January, annually average individual activity is 10 640 individuals (Table 2). The number of individuals in January - February and November is many more compared to the number in December. This may stem from inadequate observation. Mute swan is observed in Turkey in summer season, but no breeding data reported so far. Only in the summer season of 2011, a nest was found in Gala Lake and nestlings were observed in this nest. It is probably

reproducing in this area. Swan is observed regularly throughout summer in five different areas such as Meriç Delta, Gediz Delta, İğneada Forest, Kızılırmak Delta and on the coast of Zonguldak (Fig. 1). The status of the species can be accepted as resident, and it is breeding in the area. Distribution areas over the country are the costs of Black Sea, Marmara and Aegean and inland lakes (Fig. 1).

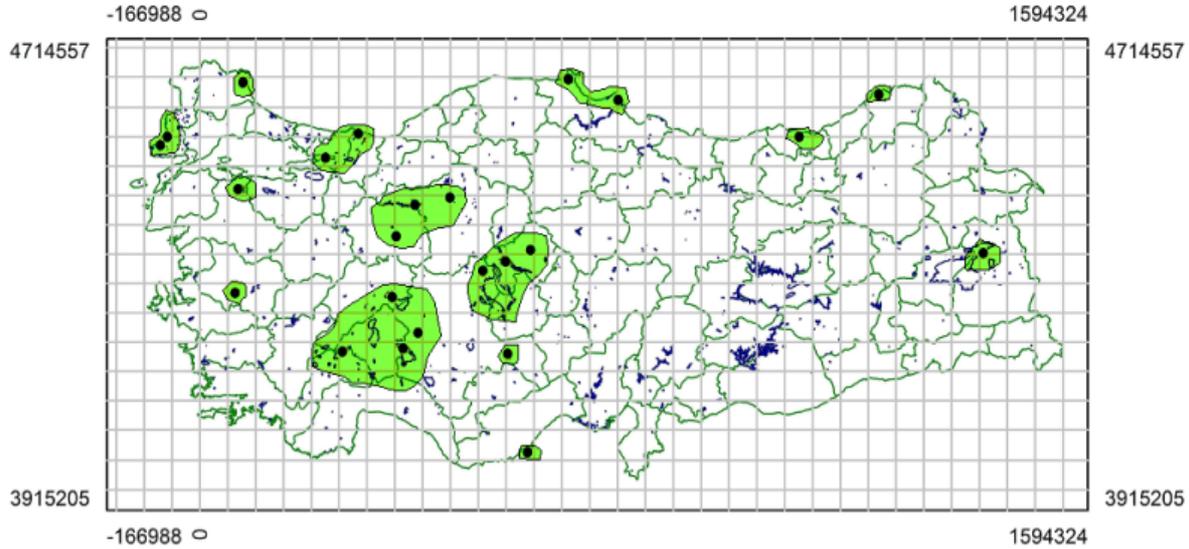


Figure 2. Observation location of Whooper swan over Turkey.

3.2. Whooper swan (*Cygnus cygnus*)

Whooper swan was observed in 46 different areas. They are winter visitor. Arrival time to winter was November, departure time was at the end of March. There are also observations in September and April. So far, the biggest count that was carried out in January 2010 in Meriç Delta with 970 individuals. Population in January was 2 077 individuals (Table 2). Average wintering population was 1 379 individuals. Annual activity of Whooper Swans in the country was 4 334 individuals per year (Table 2). Species can be seen in all geographical regions of the country (Fig. 2); Additionally the most important winter area is Meriç Delta.

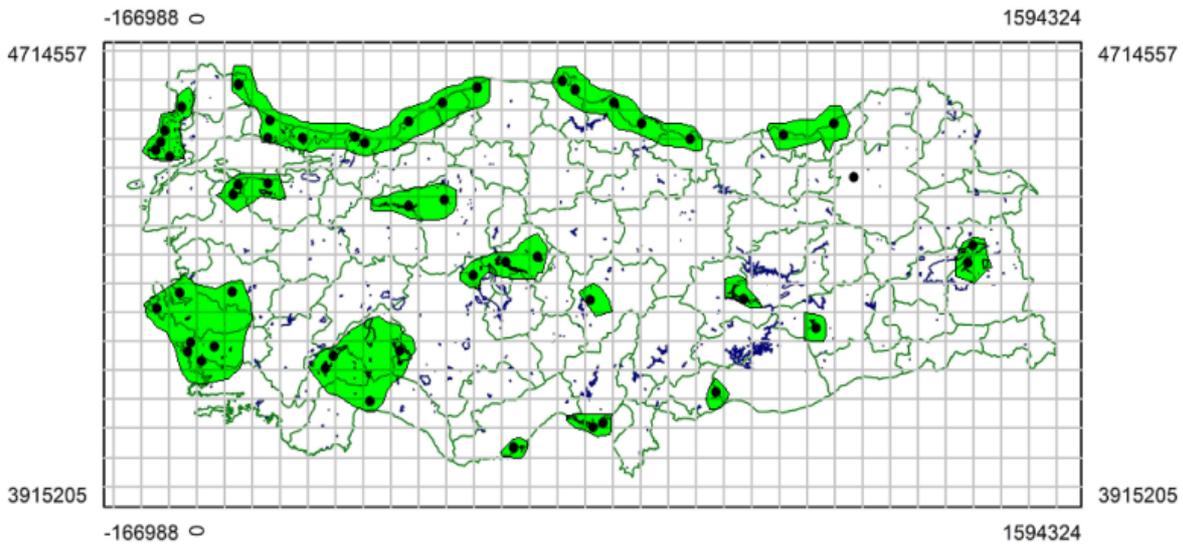


Figure 2. Observation location of Whooper swan over Turkey.

3.3. Tundra swan (*Cygnus columbianus*)

Tundra swan was observed in 26 different areas. There were no records except from March to November. They are winter migrants. Total population in January was 819 individuals and annual activity was 1 139 individuals (Table 2). The most numerous biggest counting that was carried out in 2007 with 220 individuals in Meriç Delta. General distribution of Tundra Swan is in The Region of Lakes and the south of Central Anatolian Region, but the most crowded one's winter over Meriç Delta (Fig. 3). The furthest point this species goes to south is The Delta of Mersin Göksu in winter season. When observation records were analysed, it was the species of which population varies the most in years.

4. DISCUSSION

These three species are in “Least Concern (LC)” category as globally according to their conservation statuses (IUCN 2022). In global scale there are no questions about decrease and risk in population status. However; revealing the local distribution of the species, population size and statuses will be a significant precaution for the probable dangers. As the study results put forward, Turkey is one of the southernmost wintering areas for these three species. Distribution and population status of these species in the country have been put forward. When evaluation was made according to population data from Wetlands International (2022), it was found out that Black Sea population of the Mute swan reached up to Eastern Mediterranean coast. In new evaluations, Black Sea - Eastern Mediterranean should be evaluated either as one population or as two different populations: Black Sea and Eastern Mediterranean. Breeding of Swan in Turkey is doubted. After further investigation, swan population that breeds in the southernmost areas may be completely determined.

In summer season, Whooper Swans were observed in different wetlands of the country. Because of the seasonal activity, there are small groups spending the summer in Turkey. Global climate change may lead to the formation of a permanent summer population.

Winter populations of these three species vary in years. In this case, in winter season that has harsh winter conditions on north latitudes, it may be a matter of fact that population areas of the species will be filled dramatically. In cases like these, conditions of winter areas in Turkey will gain importance for these species.

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