EURASIAN JOURNAL OF ZOOLOGY

http://eurasianzoology.com

Eurasian J Zool

(2005) 2(1): 5-12

Original Research Article

Received: 08.05.2025 | Accepted: 19.06.2025 | Published: 30.06.2025

A Study on Ornithofauna of Göründü Marshes (Van/Türkiye)

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Abstract

This research was carried out in Göründü Marshes within the borders of Van province between March 2023 and March 2024. As a result of the field studies, 71 bird species belonging to 15 orders and 28 families were identified in research area and its surroundings. Of these species, 27 were resident (% 38), 34 were summer visitors (% 48), 6 were winter visitor (% 8.4) and 4 (% 5.6) were transit migrants. The most dominant orders in the area were Passeriformes, Gruiformes Charadriiformes and Anseriformes while Ciconiiformes, Falconiformes, Strigiformes and Bucerotiformes were less dominant.

The most frequently observed species in the marshes were Eurasian coot (*Fulica atra*), common pochard (*Aythya ferina*), little grebe (*Tachybaptus ruficollis*), great crested grebe (*Podiceps cristatus*), mallard (*Anas platyrhynchos*), ruddy shelduck (*Tadorna ferruginea*), Western marsh-harrier (*Circus aeruginosus*) and black headed gull (*Larus ridibundus*).

When the bird species recorded in Göründü Marshes were examined in terms of their danger status according to the IUCN (International Union for Conservation of Nature) criteria, it was seen that 1 species was in the VU "Vulnerable = Sensitive" category (Aythya ferina-common pochard) and 2 species were in the NT "Near Threatened" category (*Vanellus vanellus*-Northern lapwing and *Limosa limosa*-black tailed godwit). According to the Bern Convention, 44 of the bird species are listed in Annex II.

Key words: Birds, wetland, Van, bioecology, ornithofauna.

1. Introduction

Birds, an integral part of nature, have always enjoyed a deep and complex relationship with human beings. Maintaining the balance of ecosystems without birds is challenging. Birds that feed on insects keep insect populations under control and maintain natural balance. Birds that feed on seeds help propagate plants, while those that feed on carrion prevent the transmission of diseases by consuming dead animals in nature. Birds also play an important role in identifying and solving ecological problems as bioindicator organisms in ecosystems. Due to these functions, birds hold great importance in nature (Del Hoyo et al., 1992; Kuru, 2020).

Birds stand out with their properties to respond to environmental changes much faster than other organisms. Due to their bioindicator properties, birds can be considered an indicator of the ecological state of an area (Amat and Green, 2012;

Mokenen, 2017). The state of ecosystems can be assessed using properties such as the presence or absence of wild birds and their abundance, mortality rate, and reproductive success. Furthermore, biodiversity patterns such as the presence and effects of stressors on birds and their relationships with other taxa can also be taken into account. Therefore, bird diversity is an indicator of the species wealth of the natural ecosystems (Egvumah, et al., 2017).

In recent years, the increasing number of ornithology studies in Türkiye has greatly increased knowledge on bird diversity and composition. However, factors such as the variability of natural processes and global warming lead to changes in the distribution maps of species over time. Therefore, it is important to analyze ecosystems sustainably and carry out more comprehensive research on bird diversity in the areas.

This study, which examined the bird fauna of Göründü Marshes, aimed to determine the population size, number of individuals, frequency and dominance values, migration status for bird species which host and grow in the study area, and the factors that positively and negatively affect the survival of the species in that area. This study brought out the bird diversity of Göründü Marshes, which has never been examined in detail from an avifaunistic study before.

2. Materials and Methods

2.1. Location and geographical characteristics of the study area

Göründü Marshes is located on the borders of Van province, on the south shore of Lake Van, northwest of the Gevaş district, and southwest of Akdamar Island. The Van-Bitlis highway runs alongside it. The reedbed site on the shore of Göründü Village covers 118 ha in size and is located between 38°19’32.2” latitude and 42°55’45.3” longitude E (Aşur and Alphan, 2017; Anonymous, 2024) (Figure 1).

Figure 1. Satellite image of the Göründü Marshes (Google Earth)

The depth of the wetland, located at an average altitude of 1648 m, varies between 7 and 9 m on average. The source of its waters comes from rainfall and surface water. Although it is an exemplary and well-preserved coastal wetland for the southern part of Lake Van, it lacks any protection status (Anonymous, 2024).

Van Province, where the study area is located, has a semiarid, low-humidity climate. Winters are harsh and cold, while summers are hot and dry. However, the moderating effect of Lake Van is strongly felt. The mean annual temperature is around 9.5 °C. The highest mean temperature was measured in August at 28.5 ºC, and the lowest mean temperature was measured in january at -7.5 ºC (Anonymous, 2025).

The different topographic structure and habitat features at variable altitudes contribute to the biodiversity of Göründü Marshes and its surroundings. Gevaş district, where Göründü Reedbed is located, has a rich floristic diversity with its diverse habitat structure. The dominant habitat structure in the Gevaş district is composed of meadows, woodlands and agricultural lands. Besides, steppe fields gradually increase more and more towards Mount Artos. The floristic researches conducted by different researchers in the area resulted in the identification of 752 taxa (Bingöl et al., 2017; Durmuş et al., 2011; Durmuş, 2024).

2.2. Method

Counting and observations were carried out for bird species in and around the Göründü Marshes between March 2023 and March 2024 for one year to determine the population size, reproduction, frequency and dominance values, and threats to the species and their habitats in this study.

The observations were made at monthly intervals to identify the population density and the number of individuals. These observations, which were concentrated during migration and breeding seasons, were mostly made between 06:00 and 11:00 and 15:00 and 19:00, when the birds peak in activity. The number of individuals were determined by Line Transect and Point Counts methods (Dobinson, 1976, Bibby and Burgess, 1992).

The equipment used during the field studies included binoculars (8 x 40), telescope, numerator, camera, lens (400 mm) and identification books. Various features such as morphological characters, flying characteristics and songs were utilized to identify the species. In this scope, identification books such as Harrison and Greensmith (2000), Svensson et al., (2011), and Heinzel et al., (1995) were consulted. The formulas used to determine the frequency and dominance of the species observed in the area were based on Kocataş (2020).

Frequency Analysis

Frequency analysis refers to the percentage of occurrence of a species in the research area (Kocataş, 2020).

Frequency (F) = Na/Nn x 100 (Na = number of observations of the species;

Nn = number of all observations)

The frequency of species in a community is analyzed under five categories:

1-20%: Rarely observed species

21 - 40 %: Seldom observed species

41 - 60 %: Often observed species

61 - 80 %: Frequently observed species

81-100: Continuously observed species

Dominance Analysis

This is the area of distribution of individuals from one species compared to individuals from all species, the ratio or the percentage representation of the ratio between the number of individuals from one species and the total number of individuals from all species (Kocataş, 2020).

Dominance (D) = Na/Nn x 100

D= Dominance, Na = Number of individuals of a species, Nn = Total number of individuals of all species

Dominance is assessed under five categories:

0 = None

+ = Rare

1 = Species with a population size less than 5%

2 = Species with a population size less than 5-25%

3 = Species with a population size less than 25-50%

4 = Species with a population size less than 50-75%

5 = Species with a population size of more than 75%

3. Results and Discussion

As a result of the field studies conducted in the Göründü Marshes, 71 bird species from 28 families in 15 orders in the area was identified between March 2023 and March 2024. Of these species; 27 were native (38%), 34 summer visitors (48%), 6 winter visitors (8.4%) and 4 (5.6%) transit migrants (Table 1).

The most dominant orders in the area were Passeriformes, Gruiformes, Charadriiformes and Anseriformes; whereas Ciconiiformes, Falconiformes, Strigiformes and Bucerotiformes were less dominant. The most frequently observed species were the coot (*F. atra*), common pochards (*A. ferina*), little grebe (*T. ruficollis*), great crested grebe (*P. cristatus*), mallard (*A. platyrhynchos*), ruddy shelduck (*T. ferruginea*), western marsh harrier (*C. aeruginosus*), and black headed gull (*L. ridibundus*).

Table 1. Bird species and their status detected in the Göründü Marshes

Ordo	Family	Species	Status	IUCN	Bern	Frequency	Dominance
Podicipediformes	**Podicipedidae**	*Tachybaptus ruficollis*	R	LC	Annex II	83	1.6
		Podiceps nigricollis	R	LC	Annex III	66	0.5
		Podiceps cristatus	R	LC	Annex II	75	0.5
Pelecaniformes	**Ardeidae**	*Ardea purpurea*	SM	LC	Annex II	58	0.8
		Ardea cinerea	R	LC	Annex III	66	0.5
		Egretta garzetta	SM	LC	Annex II	41	0.3
		Bubulcus ibis	SM	LC	Annex III	41	0.2
		Ardeola ralloides	T	LC	Annex II	16	0.1
		Nycticorax nycticorax	SM	LC	Annex II	41	0.5
	Threskiornithidae	*Plegadis falcinellus*	SM	LC	Annex II	41	0.9
Ciconiiformes	**Ciconiidae**	*Ciconia ciconia*	SM	LC	Annex II	33	0.2
Anseriformes	**Anatidea**	*Anas crecca*	W	LC	Annex III	25	0.1
		Anas platyrhynchos	R	LC	Annex III	75	0.4
		Spatula clypeata	W	LC	Annex III	25	0.1
		Netta rufina	SM	LC	Annex III	50	0.4
		Aythya ferina	R	VU	Annex III	83	1.7
		Aythya fuligula	W	LC	Annex III	33	0.2
		Cygnus cygnus	W	LC	Annex II	25	3.8
		Tadorna ferruginea	R	LC	Annex II	75	1.6
		Tadorna tadorna	R	LC	Annex II	58	0.7

Phoenicopteriformes	**Phoenicopteridae**	*Phoenicopterus roseus*	SM	LC	Annex III	50	2.2
Accipitrıiormes	**Accipitridae**	*Buteo buteo*	R	LC	Annex II	58	0.3
		Buteo rufinus	R	LC	Annex II	66	0.4
		Accipiter nisus	R	LC	Annex II	50	0.2
		Circus aeruginosus	R	LC	Annex II	75	0.5
Falconiformes	**Falconidae**	*Falco tinnunculus*	SM	LC	Annex II	41	0.2
Gruiformes	**Rallidae**	*Gallinula chloropus*	R	LC	Annex III	58	0.5
		Porphyrio porphyrio	R	LC	Annex II	50	0.4
		Fulica atra	R	LC	Annex III	100	18.8
Charadriiformes	**Recurvirostridae**	*Himantopus himantopus*	SM	LC	Annex II	58	3.03
		Recurvirostra avosetta	SM	LC	Annex II	50	2.1
	Charadriidae	*Charadrius dubius*	SM	LC	Annex II	41	1.4
		Vanellus vanellus	SM	NT	Annex III	41	0.7
	Scolopacidae	*Gallinago gallinago*	T	LC	Annex III	16	0.2
		Tringa totanus	SM	LC	Annex III	66	2.2
		Limosa limosa	R	NT	Annex III	58	0.6
	Laridae	*Larus ridibundus*	R	LC	Annex II	75	0.9
		Larus armenicus	R	LC	Annex II	58	3.7
		Chlidonias leucopterus	T	LC	Annex II	16	0.1
Columbiformes	**Columbidae**	*Columba livia*	R	LC	Annex III	66	1.3
Strigiformes	**Strigidae**	*Athene noctua*	R	LC	Annex II	50	0.3
Caprimulgiformes	**Apodidae**	*Apus apus*	SM	LC	Annex III	25	1.1
		Tachymarptis melba	SM	LC	Annex II	33	1.4
Coraciiformes	**Meropidae**	*Merops apiaster*	SM	LC	Annex II	41	1.8
	Coraciidae	*Coracias garrulus*	SM	LC	Annex II	41	1.1
Bucerotiformes	**Upupidae**	*Upupa epops*	SM	LC	Annex II	41	0.6
Passeriformes	**Alaudidae**	*Melanocorypha calandra*	R	LC	Annex II	58	0.4
		Melanocorypha bimaculata	SM	LC	Annex II	33	0.5
		Galerida cristata	R	LC	Annex III	58	1.07
		Alauda arvensis	R	LC	Annex III	58	0.7
	Hirundinidae	*Riparia riparia*	SM	LC	Annex II	41	1.7
		Hirundo rustica	SM	LC	Annex II	41	5.4
		Delichon urbicum	SM	LC	Annex II	41	3.7
	Motacillidae	*Motacilla flava*	SM	LC	Annex II	33	0.8
		Motacilla citreola	SM	LC	Annex II	33	0.7
		Motacilla cinerea	SM	LC	Annex II	50	0.9
		Motacilla alba	Y	LC	Annex II	66	0.7
	Muscicapidae	*Muscicapa striata*	W	LC	Annex II	25	0.1
		Erithacus rubecula	W	LC	Annex II	25	0.1
		Phoenicurus phoenicurus	T	LC	Annex II	8	0.1
		Saxicola torquatus	SM	LC	Annex II	33	0.5
		Oenanthe isabellina	SM	LC	Annex II	33	0.3
		Oenanthe oenanthe	SM	LC	Annex II	33	0.4
	Corvidae	*Pica pica*	R	LC	-	66	2.2
		Corvus corone	SM	LC	-	41	1.7
		Corvus frugilegus	SM	LC	-	41	2.5
	Acrocephalidae	*Acrocephalus arundinaceus*	SM	LC	Annex II	33	1.1
	Phylloscopidae	*Phylloscopus collybita*	SM	LC	Annex II	33	1.1
	Fringillidae	*Fringilla coelebs*	SM	LC	-	33	1.07
	Passeridae	*Passer domesticus*	R	LC	-	58	4.1
		Passer montanus	R	LC	Annex III	58	3.1

R: Resident SM: Summer migrant T:Transit migrant R: Resident SM: Summer migrant T:Transit migrant

According to the frequency analysis of bird species in the Göründü Marshes, four species (20 individuals) were identified in the 1–20% range; 18 species (368 individuals) in the 21–40% range; 34 species (1,358 individuals) in the 41–60% range; 12 species (355 individuals) in the 61–80% range; and three species (601 individuals) in the 81–100% range (Table 2).

Table 2. Frequency values and percentage representation of species in the area

Frequency	**1-20%**	**21-40%**	**41-60%**	**61-80%**	**81-100%**	**TOTAL**
Number of Species	4	18	34	12	3	71
%	5.63	25.35	47.9	16.9	4.22	100
Number of Individuals	20	368	1358	355	601	2702
%	0.74	13.62	50.26	13.14	22.24	100

According to the dominance analysis of the species observed in and around the reed bed, 69 species were found to be less than 5%, while two species were found to be between 5% and 25%. No species were found in the 25–50%, 50–75% or 75–100% categories (Table 3).

Table 3. Quantitative distribution of species in the area according to their dominance values

Dominance	Less than 5%	Between 5-25%	Between 25-50%	Between 50-75%	Between 75-100%	TOTAL
Number of Species	69	2	-	-	-	71
%	97.18	2.82	-	-	-	100
Number of Individuals	2046	656	-	-	-	2702
%	75.72	24.28	-	-	-	100

If the threat degrees of the bird species recorded during our studies in the Göründü Marshes were evaluated according to IUCN, one species was categorized as VU "Vulnerable=Sensitive" (*A. ferina*-common pochards), and two were categorized as NT "Near Threatened" (*V. vanellus*-northern lapwing, *L. limosa*-black tailed godwit). The other 68 species in and around the reedbed were categorized as LC "Least Concern = Low Risk". When the bird species in the area were categorized according to the Bern Convention, 44 species were listed in Annex II "Importantly Protected Species" and 21 species were listed in Annex III of the same convention (Table 3.1).

The distribution area and migration status of 71 bird species recorded in and around the Göründü Marshes conform to the data provided by Kiziroğlu (2008), Green and Moorhouse (1995), and Kirwan et al. (1998).

The common pochards (*A. ferina*) and European robin (*E. rubecula),* which were recorded as winter visitors in the study by Adızel (1998) on the birds of the Lake Van Basin, were observed as winter migrants in the present study.

Eurasian buzzard (*B. buteo)*, suggested by Gök and Adızel (2022) to be a summer visitor at Koçköprü Dam in Van-Erciş, was found to be a native, while common kestrel (*F. tinnunculus),* which was identified as a native, was found to be a summer visitor in the area.

Common redstart (*P. phoenicurus)*, suggested by Gökşen (2022) to be a summer visitor in Nemrut Caldera Natural Monument, was observed as a transit migrant in the Göründü Marshes.

Northern lapwing (*V. vanellus)*, listed as a native species by Adızel and Durmuş (2009) in their study on the bird fauna of Lake Erçek, was found as a summer visitor in our study area, while black tailed godwit (*L. limosa* and black headed gull (*L. ridibundus),* listed as winter visitors, were found as native species.

Common teal (*A. crecca*) and northern shoveler (*S. clypeata)*, listed as native species by Çelik (2018) in his study on the ornithological potential of Lake Nazik in the Ahlat district of Bitlis, were observed as winter visitors in the Göründü Marshes.

Cattle egret (*B. ibis)* and black crowned night heron (*N. nycticorax*), recorded as native species by Durmuş et al., (2018) in their study in the Dönemeç Delta within the borders of Van province, were recorded as summer visitors in the Göründü Marshes.

Calandra lark (*M. calandra),* crested lark (*G. cristata),* Eurasian skylark (*A. arvensis)* and house sparrow (*P. domesticus*), recorded as summer visitors by Ercasip (2024) in his study on the bird fauna of Lake Turna in the Gürpınar district of Van, were observed as native species in our study area.

When the Göründü Marshes are evaluated from an ornithofaunistic and bioecological perspective, it appears to be a significant area, particularly for passerines and waterbirds. Common pochard, black tailed godwit and northern lapwing among the species that nest in the area, is globally threatened. Especially, species such as the whooper swan and greater

flamingo whose population sizes remain below the required level indicates the necessity to protecting the area. During the present study, some issues that could endanger the area's biodiversity, particularly these bird species, were identified.

The presence of agricultural land on the west coast of the reedbeds puts the area at a disadvantage. Agricultural activities, which intensify during the incubation period in particular, are very disruptive for birds. Similarly, the location of the area on the edge of the Bitlis-Van highway is a drawback. Grazing in the southern part of the reedbed occasionally reaches a level that damages the reeds and their species.

The lack of any protection status in the area leads to inadequate control over activities such as uncontrolled reed cutting and burning, overgrazing and illegal hunting. It is necessary to raise awareness among the local people about the importance of the reeds and the species in the area. To this end, signboards and information about the species breeding in the area can be placed at the entrance and certain points of the reed. The Göründü Marshes should be granted a legal protection status as soon as possible by prioritizing the species that inhabit and breed there. The bird fauna of the area is thought to become richer through the measures to be taken. Thus, both the biodiversity of the area will be protected, and the ecotourism potential will grow and contribute to regional tourism.

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