



The Avifauna of Lake Seyfe[#]

Elif Omca Çobanoğlu^{1,a,*}

¹Department of Science and Mathematics Education, Faculty of Education, Ondokuz Mayıs University, 55270 Samsun, Turkey

*Corresponding author

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ABSTRACT

Turkey has a great ornithological importance, due to its geographical location, topography, wide territory and different climatic types. From a biodiversity perspective, wetlands are one of the most important areas. Lake Seyfe is one of the important wetlands with economic and ecological value. After being declared a Natural Protected Area in 1989, Lake Seyfe, which gained the status of Natural Protection Area in 1990 and finally declared Ramsar Site in 1994, is extremely important for birds. The lake meets 3 out of 9 Criteria for Identifying Wetlands of International Importance. The research aims to determine bird species of Lake Seyfe by gathering the information contained in the literature covering all observations made in the following years, in addition to the regular field studies conducted weekly between 1996 and 1998. Therefore, a list of birds obtained from all observations made between 1996-2019 has been created. As a result, 26 orders, 57 families, 242 species and 4 subspecies were identified in the site. 20 of the recorded species are globally endangered according to the IUCN red list criteria. Lake Seyfe, an internationally important wetland, is also an important feeding and visiting place for birds during migration.

^a  omcacobanoglu@gmail.com

 <http://orcid.org/0000-0002-3691-8273> |



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Introduction

Wetlands have ecological and economic importance and are treasures of biodiversity. Wetlands have been regarded as worthless places filled with insects seen as useless and even causing diseases throughout history; avifauna studies concerning them have gained momentum in many parts of the world, especially after the 1971 Ramsar Convention (Bhat et al., 2009). In Turkey, there are 135 wetlands included in the "wetlands of international importance" category according to Ramsar (Karadeniz et al., 2009). As in the other branches of biology in our country, ornithological studies began in the 19th century with the notes taken by German and British biologists visiting our country. The first indigenous study was Ergene's book about birds written in 1945 and continued intermittently until today (Turan, 1990). Avifauna of many sites that are important for the birds has not been examined sufficiently in our country, which occupies a very important place in terms of biological richness

(Çobanoğlu, 2000). One of them is Lake Seyfe; although the significance of the site for the birds is emphasized in many sources, there is no long-term and continuous study (Kılıç et al., 2004; DHKD, 1989, 1990, 1992, 1994; DSI, 1990; Dugan, 1990; Ertan et al., 1990). Lake Seyfe, which is located within the boundaries of Kırşehir province, and an area of 10,700 hectares around the lake was declared "Natural Conservation Area" on 26.08.1990 in order to protect the natural and ecological assets of the lake against the pollution and deterioration and to ensure its transfer to future generations (Çobanoğlu, 2000). Lake Seyfe is also included in the international list in accordance with the Ramsar Convention published in the Official Gazette dated 17.05.1994 and numbered 21937 (Çobanoğlu, 2000). Ornithological information obtained by collecting all regular observations and records available in the literature from 1996 to 1998 concerning the lake, which is of importance for birds and is under protection, is believed to

be useful in closing the deficit in the literature. For this reason, the study was conducted to determine the Avifauna of Lake Seyfe by merging the accessible ornithological data between 1996-2019.

Description of the Study Area

Lake Seyfe is located in the Central Kızılırmak section of Central Anatolia. Geographically, it is between 39° 18' North - 34° 23' East coordinates. Lake Seyfe, is formed in a shallow, wide, salty and tectonic pit. The lake, which is 25 km away from Mucur district and 30 km from Kırşehir, is located in the northeast of Kırşehir (Yiğitbaşıoğlu, 1995). Being a wetland, the site consists of marshes and reeds. In non-dry times, there are many large and small islets of reeds near the shore at the east of the lake. There are six villages around the lake; Gümüşkumbet, Kızıldağ, Budak, Yazıkınık, Seyfe, and Eskidoğanlı (T.C. Çevre Bakanlığı, 1992).

Status of the Study Area

Lake Seyfe, located at the southern end of the Seyfe closed basin, covers an area of 152,200 ha. In 1989, a part of 23,585 hectares were declared as “Grade 1 Natural Site Area” and then in 1990, 10,700 hectares has gained the status of “Nature Conservation Areas”. Most recently, it was included in the agreement list as a “Ramsar Site” in 1994 (Lake Seyfe Management Plan 2011-2015). Lake Seyfe, which is a Ramsar Site, meets 3 of the 9 criteria (Criteria 2, 4 and 5) required to become an internationally important wetland (Erciyas Yavuz, 2016).

Criterion 2: It supports vulnerable species included in the red list categories of the International Union for Conservation of Nature (IUCN). There are sensitive species such as Great Bustard (*Otis tarda*), Imperial Eagle (*Aquila heliaca*), Greater Spotted Eagle (*Aquila clanga*).

Criterion 4: It provides refuge during the wintering period of the birds. Flamingos are extensively present there in winter (32,000 Greater Flamingo were recorded in 1987). In addition, the storks form large colonies at the site (130 individuals were recorded during migration).

Criterion 5: There are 20,000 individual waterbird species at the site on a regular basis. The maximum was recorded between 1969 and 1970, as 152,380 birds, while in the 1986 census 32,000 waterbirds were recorded.

The Significance of Lake Seyfe for Birds

Although Seyfe Lake is not very rich in flora and fauna, it is an important place for birds during spring and autumn migrations. A part of the birds, coming to Turkey while migrating southward from the high latitudes in autumn to spend the winter, stay shortly only for resting (passage migrant), whereas some of them spend the incubation period (summer migrant) here. Thus, the bird population in the salty lakes of Central Anatolia increases considerably during this period. In this respect, Lake Seyfe Lake and Sultan Marshes are the two major wetlands. The air distance between these two lakes, is 120 km (Yiğitbaşıoğlu, 1995). Therefore, although these two ecosystems have been counted from time to time by various scientists and birdwatchers, their exact avifauna

have not been fully identified until this study. It is an important stopover and feeding area during migration periods. As a result of the observations made in 1972 and 1974, it was included in the List of Wetlands of International Importance and today it is a Class A wetland according to international criteria. The site is also an important gathering area where flamingos and storks are found in large groups especially in autumn (Erciyas Yavuz, 2016).

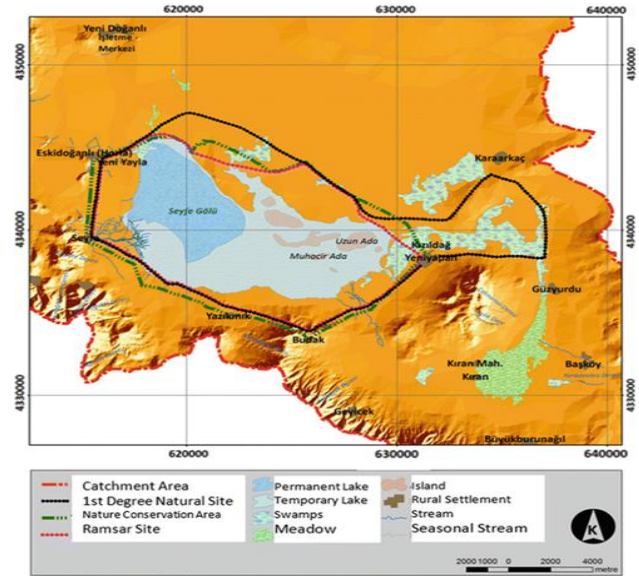


Figure 1. Lake Seyfe protected areas (T.C. Çevre Bakanlığı, 2011)

Studies Concerning the Avifauna of the Lake Conducted So Far

- “Birds of Turkey: Seyfe Lake” published by Husband and Kasperek (1984) recorded 167 bird species in the site (Erciyas Yavuz, 2016).
- In a study conducted in 1999, it was mentioned that there are 109 bird species in and around Lake Seyfe (T. C. Çevre Bakanlığı, 1999).
- The author (2000) recorded 215 species in his doctoral dissertation titled “Avifauna of Lake Seyfe”, realized between 1996 and 1998.
- Beside these, Midwinter Waterfowl Census given in Table 5 were performed in different years.
- In the “Arid Area of Seyfe Becomes a Lake” project completed in 2009, more than 100 bird species have been identified.
- Lake Seyfe Wetland Management Plan by the Ministry of Environment and Forestry, in 2011 (2011-2015)

Methodology

The main data of the study consisted of regular visits to the site between 1996 and 1998 every week, twice a week. All birds seen and heard in the region were recorded meticulously in the form developed by the researcher without distinguishing the Passeriformes. The study was conducted with standard point counting, which is one of the birds counting methods (Bibby, Burgess, Hill and Mustoe, 2000). At the same time, literature was reviewed,

and the avifauna of Lake Seyfe was created by including all counts related to Lake Seyfe (Erciyas Yavuz, 2016; Kusbank 2010; T.C. Çevre Bakanlığı, Kış Ortası Su Kuşu Sayımları, 1992, 2014, 2015, 2016, 2018, 2019; WIWO Report 1986, 1988).

Waterfowl on the surface of the lake were mostly counted over Kale Höyük, the dominant hill located at the southwest of the lake. Since this counting would not be sufficient to identify all species in a healthy way, the lake shore was approached as much as possible and the census was controlled from other points dominating the lake. In addition, the areas around the lake were toured as far as possible. However, there are very muddy areas where the vehicle cannot enter, especially in rainy seasons; these places were reached by car as much as possible, and the census was taken in important places by crossing through walking. All midwinter waterfowl census taken in the site beside the mentioned years were reviewed, the necessary additions were made, and the species list was finalized (T. C. Çevre Bakanlığı, Kış Ortası Su Kuşu Sayımları, 1992, 2014, 2015, 2016, 2018, 2019; WIWO Report 1986, 1988).

Results

The area has been visited irregularly by bird watchers since 1968. "Birds of Turkey: Lake Seyfe" published in 1984 reported that there were 167 bird species in the site (Ornithological Society of the Middle East, 1984). Greater Flamingo (*Phoenicopterus roseus*), which is considered to be the flagship species of the lake, was first bred in 1970. Although there is no data indicating the regular breeding of this species at the region since the site is not counted regularly, it was stated that they are present at the lake in large numbers especially in the autumn months. T. Gürpınar reported that 320,000 Greater Flamingos stayed at the lake in the autumn of 1986 (Çobanoğlu, 2000). As a result of the midwinter waterfowl census, it is seen that this number has significantly decreased but they still use the lake as a feeding, resting and staging area, therefore it is considered as the flagship species. The number of bird species was found to be 109 in the "Ecological Investigation of Wetlands of International Importance" project by a special environmental consultancy company commissioned by the General Directorate of Environmental Protection, Department of Sensitive Ecosystems and Protected Areas under the Ministry of Environment in 1998 and 1999 (T.C. Çevre Bakanlığı, 1999). The most comprehensive and longest research conducted to identify the bird species in the site, is the doctoral dissertation titled "Avifauna of Lake Seyfe" by the author between 1996-1998. Within the scope of this research, 215 species and 4 subspecies from 50 families were identified around the lake by the researcher. In addition, 124 out of 215 species were observed in the site during summer months. After the researcher observed that a large number of White Pelicans (*Pelecanus onocrotalus*) also bred in the area, no new record was found about the breeding of this species in the site due to the lack of regular censuses, especially in the summer months. Since the area is located in Central Anatolia and is surrounded by farmland, there are no vegetation to host birds and woodpeckers, thus only a small number of Passeriformes have been observed. Observations of these species were generally made in the wooded area around Seyfe and Eskidoğan Village.

Especially during the migration season, the storks White Stork (*Ciconia Ciconia*) feed, rest and stay around the lake area in large flocks. Besides, the stork's nests in the villages around the lake were counted and they were seen to breeding (Çobanoğlu, 2000). Lake Seyfe was assessed as an "Important Bird Area (IBA)" by Magnin and Yazar (1997). The species that meet the IBA criteria are given as follows: White Pelican (100 pairs), Spoonbill (50 pairs), Greater Flamingo (2000 pairs), Red-Crested Pochard (15 pairs), Avocet (500 pairs), Spur-Winged Plover (10 pairs), Mediterranean Gull (500 pairs), Gull-Billed Tern (500 pairs) and little tern (500 pairs). In winter there are large numbers of waterfowl (max. 152,000). White-Fronted Goose (max.7200) and Ruddy Shelduck (max. 978) are examples of them. Magnin and Yazar (1997) stated that Marbled Duck is likely to breed in the site. However, it was found that some of these species either do not breed in the site or their number decreased considerably. Lake Seyfe Emergency Action Plan (2009) reported an abandoned Steppe Eagle (*Aquila nipalensis*) nest in the site, but nowadays the only steppe eagle breeding area is near Salt Lake. As a result of the evaluation of all available information in the literature and the review of all records held between 1996-2019, 242 bird species were identified in and around Lake Seyfe (Table 1a, 1b, 1c, 1d, 1e). Table 1 also shows, Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) (COE, 1979), IUCN Red List Status and Distribution Status.

As can be seen from the list above, the orders identified in Lake Seyfe and the families and species numbers of them are as follows: PODICIPEDIFORMES; Podicipedidae 2, SULIFORMES; Phalacrocoracidae 1, PELECANIFORMES; Pelecanidae 2, Ardeidae 9, Threskiornithidae 2, CICONIIFORMES; Ciconiidae 2, PHOENICOPTERIFORMES; Phoenicopteridae 1, ANSERIFORMES, Anatidae 19, ACCIPITRIFORMES; Accipitridae 17, FALCONIFORMES; Falconidae 9, GALLIFORMES; Phasianidae 3, GRUIFORMES; Rallidae 5, GRUIFORMES; Gruidae 1, OTIDIFORMES; Otidae 1, CHARADRIIFORMES; Haematopodidae 1, Recurvirostridae 2, Burhinidae 1, Glareolidae 1, Charadriidae 9, Scolopacidae 20, Laridae 16, PTEROCLIFORMES; Pteroclididae 1, COLUMBIFORMES; Columbidae 5, PSITTACIFORMES; Psittacidae 1, CUCULIFORMES; Cuculidae 1, STRIGIFORMES; Strigidae 4, CAPRIMULGIFORMES, Caprimulgidae 1, APODIFORMES, Apodidae 1, CORACIIFORMES; Alcedinidae 1, CORACIIFORMES; Meropidae 1, CORACIIFORMES; Coraciidae 1, BUCEROTIFORMES; Upupidae 1, PICIFORMES; Picidae 2, PASSERIFORMES; Alaudidae 7, Hirundinidae 4, Motacillidae 9, Troglodytidae 3, Prunellidae 1, Muscicapidae 18, Turdidae 4, Cettiidae 1, Locustellidae 1, Acrocephalidae 6, Sylviidae 6, Phylloscopidae 3, Panuridae 1, Aegithalidae 1, Paridae 2, Sittidae 1, Remizidae 1, Oriolidae 1, Laniidae 3, Corvidae 5, Sturnidae 2, Passeridae 4, Fringillidae 8 and Emberizidae 6. 24 orders, 57 families, 242 species and 4 subspecies were recorded. There were times where more than 25,000 birds counted in a day by the researcher: namely 25,629 birds on 22.02.1997 and 42,606 birds on 04.03.1997. The review of all species from all sources revealed that 242 bird species have been identified in the site to date (Kusbank, 2010, Erciyas Yavuz, 2016, T.C. Orman ve Su İşleri Bakanlığı, Kış Ortası Su Kuşu Sayımları, 2018, 2019).

Table 1a. Birds detected in Lake Seyfe wetland area (Aves)

No	Scientific name	Common name	Bern Convention Appendices	IUCN Red List Status	Status
	PODICIPEDIFORMES	Podicipedidae			
1	<i>Tachybaptus ruficollis</i>	Little Grebe	II	LC	R, W
2	<i>Podiceps cristatus</i>	Great Crested Grebe	III	LC	R, W
	SULIFORMES	Phalacrocoracidae			
3	<i>Microcarbo pygmeus</i>	Pygmy Cormorant	II	LC	R, w
	PELECANIFORMES	Pelecanidae			
4	<i>Pelecanus onocrotalus</i>	White Pelican	II	LC	s, P, w
5	<i>Pelecanus crispus</i>	Dalmatian Pelican	II	NT	R, W
	PELECANIFORMES	Ardeidae			
6	<i>Botaurus stellaris</i>	Bittern	II	LC	R, p, w
7	<i>Ixobrychus minutus</i>	Little Bittern	II	LC	S, P
8	<i>Nycticorax nycticorax</i>	Nighth Heron	II	LC	S, P
9	<i>Ardeola ralloides</i>	Squacco heron	II	LC	S, P
10	<i>Bubulcus ibis</i>	Cattle Egret	II	LC	s, p, w
11	<i>Egretta garzetta</i>	Little Egret	II	LC	R, P, W
12	<i>Ardea alba</i>	Great White Egret	II	LC	s, P, W
13	<i>Ardea cinerea</i>	Grey Heron	III	LC	R, P, W
14	<i>Ardea purpurea</i>	Purple Heron	II	LC	S, P
	PELECANIFORMES	Threskiornithidae			
15	<i>Plegadis falcinellus</i>	Glossy Ibis	II	LC	S, P
16	<i>Platalea leucorodia</i>	Spoonbill	II	LC	R, P, w
	CICONIIFORMES	Ciconiidae			
17	<i>Ciconia nigra</i>	Black Stork	II	LC	S, P, w
18	<i>Ciconia ciconia</i>	White Stork	II	LC	S, P, w
	PHOENICOPTERIFORMES	Phoenicopteridae			
19	<i>Phoenicopterus roseus</i>	Greater Flamingo	II	LC	R, S, W
	ANSERIFORMES	Anatidae			
20	<i>Cygnus cygnus</i>	Whooper Swan	II	LC	W
21	<i>Anser fabalis</i>	Bean Goose	III	LC	V
22	<i>Anser albifrons</i>	White-fronted Goose	III	LC	p, W
23	<i>Anser anser</i>	Greylag Goose	III	LC	R, W
24	<i>Branta ruficollis</i>	Red-breasted Goose	II	VU	w
25	<i>Tadorna ferruginea</i>	Ruddy Shelduck	II	LC	R, W
26	<i>Tadorna tadorna</i>	Shelduck	II	LC	R, W
27	<i>Anas penelope</i>	Wigeon	III	LC	W
28	<i>Anas strepera</i>	Gadwall	III	LC	R, W
29	<i>Anas crecca</i>	Teal	III	LC	r, W
30	<i>Anas platyrhynchos</i>	Mallard	III	LC	R, W
31	<i>Anas acuta</i>	Pintail	III	LC	r, P, W
32	<i>Anas querquedula</i>	Garganey	III	LC	S, P, w
33	<i>Anas clypeata</i>	Shoveler	III	LC	r, P, W
34	<i>Marmaronetta angustirostris</i>	Marbled Duck	II	VU	S, w
35	<i>Netta rufina</i>	Red-crested Pochard	III	LC	R, W
36	<i>Aythya ferina</i>	Pochard	II	VU	R, P, W
37	<i>Aythya nyroca</i>	Ferruginous Duck	III	NT	R, P, W
38	<i>Aythya fuligula</i>	Tufted Duck	III	LC	R, P, W
	ACCIPITRIFORMES	Accipitridae			
39	<i>Pernis apivorus</i>	Honey Buzzard	III	LC	S, P
40	<i>Milvus migrans</i>	Black Kite	III	LC	S, P, W
41	<i>Neophron percnopterus</i>	Egyptian Vulture	III	EN	S, P
42	<i>Circaetus gallicus</i>	Short-toed Eagle	III	LC	S, P
43	<i>Circus aeruginosus</i>	Marsh Harrier	III	LC	R, P, w
44	<i>Circus cyaneus</i>	Hen Harrier	III	LC	P, W
45	<i>Circus macrourus</i>	Pallid Harrier	III	NT	s, P, w
46	<i>Circus pygargus</i>	Montagu's Harrier	III	LC	S, P
47	<i>Accipiter gentilis</i>	Goshawk	III	LC	R, P, W
48	<i>Accipiter nisus</i>	Sparrowhawk	III	LC	R, P, W
49	<i>Buteo buteo</i>	Buzzard	III	LC	R, P, W
50	<i>Buteo rufinus</i>	Long-legged Buzzard	III	LC	R
51	<i>Aquila pomarina</i>	Booted Eagle	III	LC	s, P
52	<i>Aquila nipalensis</i>	Steppe Eagle	III	EN	s, P
53	<i>Aquila heliaca</i>	Imperial Eagle	III	VU	R, P, W
54	<i>Aquila chrysaetos</i>	Golden Eagle	III	LC	R
55	<i>Hieraetus pennatus</i>		III	LC	S, P

Table 1b. Birds detected in Lake Seyfe wetland area (Aves)

No	Scientific name	Common name	Bern Convention Appendices	IUCN Red List Status	Status
56	<i>Falco naumanni</i>	Lesser Kestrel	II	LC	S, p
57	<i>Falco tinnunculus</i>	Kestrel	II	LC	R, P, W
58	<i>Falco vespertinus</i>	Red-footed Falcon	II	NT	P
59	<i>Falco columbarius</i>	Merlin	II	LC	p, W
60	<i>Falco subbuteo</i>	Hobby	II	LC	S, P
61	<i>Falco eleonora</i>	Eleonora's Falcon	II	LC	S, P
62	<i>Falco biarmicus</i>	Lanner	II	LC	r
63	<i>Falco cherrug</i>	Saker	II	EN	R, p, w
64	<i>Falco peregrinus</i>	Peregrine	II	LC	R, p, W
	GALLIFORMES	Phasianidae			
65	<i>Alectoris chukar</i>	Chukar	III	LC	R
66	<i>Perdix perdix</i>	Grey Partridge	III	LC	R
67	<i>Coturnix coturnix</i>	Quail	III	LC	S, P, w
	GRUIFORMES	Rallidae			
68	<i>Rallus aquaticus</i>	Water Rail	III	LC	R, W
60	<i>Porzana porzana</i>	Spotted Crake	II	LC	s, P, w
70	<i>Porzana parva</i>	Little Crake	II	LC	s, P
71	<i>Gallinula chloropus</i>	Moorhen	III	LC	R, P, W
72	<i>Fulica atra</i>	Coot	III	LC	R, W
	GRUIFORMES	Gruidae			
73	<i>Grus grus</i>	Crane	II	LC	S, P, W
	OTIDIFORMES	Otididae			
74	<i>Otis tarda</i>	Great Bustard	II	VU	R, w
	CHARADRIIFORMES	Haematopodidae			
75	<i>Haematopus ostralegus</i>	Oystercatcher	III	NT	R, S, P, W
	CHARADRIIFORMES	Recurvirostridae			
76	<i>Himantopus himantopus</i>	Black-winged Stilt	II	LC	S, w
77	<i>Recurvirostra avosetta</i>	Avocet	II	LC	R, W
	CHARADRIIFORMES	Burhinidae			
78	<i>Burhinus oediconemus</i>	Stone-curlew	II	LC	S, p
	CHARADRIIFORMES	Glareolidae			
79	<i>Glareola pratincola</i>	Collared Pratincole	II	LC	S, p
	CHARADRIIFORMES	Charadriidae			
80	<i>Charadrius dubius</i>	Little Ringed Plover	II	LC	S, P
81	<i>Charadrius hiaticula</i>	Ringed Plover	II	LC	P, W
82	<i>Charadrius alexandrinus</i>	Kentish Plover	II	LC	R, S, W
83	<i>Charadrius leschenaultii</i>	Greater sand Plover	II	LC	S, p
84	<i>Charadrius morinellus</i>	Dotterel	II	LC	P
85	<i>Pluvialis apricaria</i>	Golden Plover	III	LC	P, W
86	<i>Pluvialis squatarola</i>	Grey Plover	III	LC	P, W
87	<i>Vanellus spinosus</i>	Spur-winged Plover	II	LC	S
88	<i>Vanellus vanellus</i>	Lapwing	III	NT	R, W
	CHARADRIIFORMES	Scolopacidae			
89	<i>Calidris minuta</i>	Little Stint	II	LC	P, W
90	<i>Calidris temminckii</i>	Temminck's Stint	II	LC	P, w
91	<i>Calidris ferruginea</i>	Curlew Sandpiper	II	NT	P, w
92	<i>Calidris alpina</i>	Dunlin	II	LC	P, W
93	<i>Philomachus pugnax</i>	Ruff	III	LC	P, W
94	<i>Gallinago gallinago</i>	Snipe	III	LC	P, W
95	<i>Scolopax rusticola</i>	Woodcock	III	LC	P, W
96	<i>Limosa limosa</i>	Black-tailed Godwit	III	NT	P, W
97	<i>Limosa lapponica</i>	Bar-tailed Godwit	III	NT	p, w
98	<i>Numenius phaeopus</i>	Whimbrel	III	LC	P
99	<i>Numenius tenuirostris</i>	Slender-billed Curlew	II	CR	V
100	<i>Numenius arquata</i>	Curlew	III	NT	P, W
101	<i>Tringa erythropus</i>	Spotted Redshank	III	LC	P, W
102	<i>Tringa totanus</i>	Redshank	III	LC	S, P, W
103	<i>Tringa stagnatilis</i>	Marh Sandpiper	II	LC	P
104	<i>Tringa nebularia</i>	Greenshank	III	LC	P, W
105	<i>Tringa ochropus</i>	Green Sandpiper	II	LC	s, P, W
106	<i>Tringa glareola</i>	Wood Sandpiper	II	LC	P
107	<i>Actitis hypoleucos</i>	Common Sandpiper	II	LC	S, P, w
108	<i>Arenaria interpres</i>	Turnstone	II	LC	P, w

Table 1c. Birds detected in Lake Seyfe wetland area (Aves)

No	Scientific name	Common name	Bern Convention Appendices	IUCN Red List Status	Status
	CHARADRIIFORMES	Laridae			
109	<i>Ichthyaetus ichthyaetus</i>	Great Black-headed Gull	III	LC	W
110	<i>Ichthyaetus melanocephalus</i>	Mediterranean Gull	II	LC	S, P, W
111	<i>Hydrocoloeus minutus</i>	Little Gull	II	LC	P, W
112	<i>Chroicocephalus ridibundus</i>	Black-headed Gull	III	LC	r, W
113	<i>Chroicocephalus genei</i>	Slender-billed Gull	II	LC	S, p, W
114	<i>Larus canus</i>	Common Gull	III	LC	W
115	<i>Larus armenicus</i>	Armenian Gull	III	NT	R, W
116	<i>Larus cachinnans</i>	Caspian Gull		LC	W
117	<i>Larus michahellis</i>	Yellow-legged Gull	III	LC	R, W
118	<i>Larus marinus</i>	Great Black-backed Gull	III	LC	V
119	<i>Gelochelidon nilotica</i>	Gull-billed Tern	II	LC	S, P
120	<i>Sterna hirundo</i>	Common Tern	II	LC	S, P
121	<i>Sternula albifrons</i>	Little Tern	II	LC	S, P
122	<i>Chlidonias hybrida</i>	Whiskered Tern	II	LC	S, P, w
123	<i>Chlidonias niger</i>	Black Tern	II	LC	s, P
124	<i>Chlidonias leucopterus</i>	White-winged Black Tern	II	LC	s, P
	PTEROCLIFORMES	Pteroclididae			
125	<i>Pterocles orientalis</i>	Black-bellied Sandgrouse	II	LC	S, w
	COLUMBIFORMES				
126	<i>Columba livia</i>	Rock Dove	III	LC	R
127	<i>Columba oenas</i>	Stock Dove	III	LC	r, P, W
128	<i>Columba palumbus</i>	Woodpigeon	-	LC	R, P, W
129	<i>Streptopelia decaocto</i>	Collared Dove	III	LC	R
130	<i>Streptopelia turtur</i>	Turtle Dove	III	VU	S, P
	PSITTACIFORMES	Psittacidae			
131	<i>Psittacula krameri</i>	Ring-necked parakeet	III	LC	R
	CUCULIFORMES	Cuculidae			
132	<i>Cuculus canorus</i>	Cockoo	III	LC	S, P
	STRIGIFORMES	Strigidae			
133	<i>Otus scops</i>	Scops Owl	II	LC	S, w
134	<i>Athene noctua</i>	Little Owl	II	LC	R
135	<i>Asio otus</i>	Long-eared Owl	II	LC	R, W
136	<i>Asio flammeus</i>	Short-eared Owl	II	LC	r, W
	CAPRIMULGIFORMES	Caprimulgidae			
137	<i>Caprimulgus europaeus</i>	Nightjar	II	LC	S, P
	APODIFORMES	Apodidae			
138	<i>Apus apus</i>	Swift	III	LC	S, P
	CORACIIFORMES	Alcedinidae			
139	<i>Alcedo atthis</i>	Kingfisher	II	LC	r, P, W
	CORACIIFORMES	Meropidae			
140	<i>Merops apiaster</i>	Bee-eater	III	LC	S, P
	CORACIIFORMES	Coraciidae			
141	<i>Coracias garrulus</i>	Roller	II	LC	S, P
	BUCEROTIFORMES	Upupidae			
142	<i>Upupa epops</i>	Hoopoe	II	LC	S, P
	PICIFORMES	Picidae			
143	<i>Jynx torquilla</i>	Wryneck	III	LC	s, P, w
144	<i>Dendrocopos syriacus</i>	Syrian Woodpecker	II	LC	R
	PASSERIFORMES	Alaudidae			
145	<i>Melanocorypha calandra</i>	Clandra Lark	II	LC	R
146	<i>Melanocorypha bimaculata</i>	Bimaculated Lark	II	LC	S, p
147	<i>Calandrella brachydactyla</i>	Short-toed Lark	II	LC	S, P
148	<i>Calandrella rufescens</i>	Lesser Short-toed Lark	II	LC	S, w
149	<i>Galerida cristata</i>	Crested Lark	III	LC	R
150	<i>Alauda arvensis</i>	Skylark	III	LC	R, P, W
151	<i>Eremophila alpestris</i>	Shore Lark	II	LC	R, W
	PASSERIFORMES	Hirundinidae			
152	<i>Riparia riparia</i>	Sand Martin	II	LC	S, P
153	<i>Hirundo rustica</i>	Swallow	II	LC	S, P
154	<i>Cecropis daurica</i>	Red-rumped Swallow	II	LC	S, P
155	<i>Delichon urbicum</i>	House Martin	II	LC	S, P

Table 1d. Birds detected in Lake Seyfe wetland area (Aves)

No	Scientific name	Common name	Bern Convention Appendices	IUCN Red List Status	Status
	PASSERIFORMES	Motacillidae			
156	<i>Anthus campestris</i>	Tawny Pipit	II	LC	S, P
157	<i>Anthus trivialis</i>	Tree Pipit	II	LC	S, P
158	<i>Anthus pratensis</i>	Meadow Pipit	II	NT	P, W
159	<i>Anthus cervinus</i>	Red-throated Pipit	II	LC	P, w
160	<i>Anthus spinoletta</i>	Water Pipit	II	LC	R, W
161	<i>Motacilla flava</i>	Yellow Wagtail	II	LC	S, P
162	<i>Motacilla citreola</i>	Citrine Wagtail	II	LC	S, P
163	<i>Motacilla cinerea</i>	Grey Wagtail	II	LC	R, P, W
164	<i>Motacilla alba</i>	Pied Wagtail	II	LC	R, P, W
	PASSERIFORMES	Troglodytidae			
165	<i>Troglodytes troglodytes</i>	Wren	II	LC	R, W
	PASSERIFORMES	Prunellidae			
166	<i>Prunella modularis</i>	Dunnoek	II	LC	r, P, W
	PASSERIFORMES	Muscicapidae			
167	<i>Erithacus rubecula</i>	Robin	II	LC	R, P, W
168	<i>Luscinia luscinia</i>	Thrush Nightingale	II	LC	P
169	<i>Luscinia megarhynchos</i>	Nightingale	II	LC	S, P
170	<i>Luscinia svecica</i>	Bluethroat	II	LC	s, P, W
171	<i>Irania gutturalis</i>	White-throated Robin	II	LC	S
172	<i>Phoenicurus ochruros</i>	Black Redstart	II	LC	R, P, W
173	<i>Phoenicurus phoenicurus</i>	Redstart	II	LC	R, P
174	<i>Saxicola rubetra</i>	Whinchat	II	LC	R, P
175	<i>Saxicola torquatus</i>	Stonechat	II	LC	R, W
176	<i>Oenanthe isabellina</i>	Isabelline Wheatear	II	LC	S, P
177	<i>Oenanthe oenanthe</i>	Northern Wheatear	III	LC	S, P
178	<i>Oenanthe pleschanka</i>	Pied Wheatear	II	LC	s, P
179	<i>Oenanthe hispanica</i>	Black-earned Wheatear	II	LC	S, p
180	<i>Oenanthe finschii</i>	Finsch's Wheatear	II	LC	R, w
181	<i>Muscicapa striata</i>	Spotted Flycatcher	II	LC	S, P
182	<i>Ficedula parva</i>	Red-breasted Flycatcher	II	LC	s, P
183	<i>Ficedula semitorquata</i>	Semi-collared Flycatcher	II	LC	S, P
184	<i>Ficedula albicollis</i>	Collared Flycatcher	II	LC	P
	PASSERIFORMES	Turdidae			
185	<i>Turdus merula</i>	Blackbird	II	LC	R, P, W
186	<i>Turdus pilaris</i>	Fieldfare	II	LC	P, W
187	<i>Turdus philomelos</i>	Song Thrush	II	LC	R, P, W
188	<i>Turdus iliacus</i>	Redwing	II	NT	P, W
	PASSERIFORMES	Cettiidae			
189	<i>Cettia cetti</i>	Cetti's Warbler	II	LC	R, W
	PASSERIFORMES	Locustellidae			
190	<i>Locustella luscinoides</i>	Savi's Warbler	II	LC	S, P
	PASSERIFORMES	Acrocephalidae			
191	<i>Acrocephalus melanopogon</i>	Moustached Warbler	II	LC	R, P, W
192	<i>Acrocephalus scirpaceus</i>	Reed Warbler	II	LC	S, P
193	<i>Acrocephalus arundinaceus</i>	Great Reed Warbler	II	LC	S, P
194	<i>Iduna pallida</i>	Eastern Olivaceous Warbler	II	LC	S, P
195	<i>Hippolais olivetorum</i>	Olive-tree Warbler	II	LC	S, P
196	<i>Hippolais icterina</i>	Icterine Warbler	II	LC	s, P
	PASSERIFORMES	Sylviidae			
197	<i>Sylvia melanocephala</i>	Sardinian Warbler	II	LC	R, p, w
198	<i>Sylvia crassirostris</i>	Eastern Orphean Warbler	II	LC	S, P
199	<i>Sylvia curruca</i>	Lesser Whitethroat	II	LC	S, P
200	<i>Sylvia communis</i>	Whitethroat	II	LC	S, P
201	<i>Sylvia borin</i>	Garden Warbler	II	LC	S, P
202	<i>Sylvia atricapilla</i>	Blackcap	II	LC	R, P, w
	PASSERIFORMES	Phylloscopidae			
203	<i>Phylloscopus sibilatrix</i>	Wood Warbler	II	LC	s, P
204	<i>Phylloscopus collybita</i>	Chiffchaff	II	LC	R, P, W
205	<i>Phylloscopus trochilus</i>	Willow Warbler	II	LC	P
	PASSERIFORMES	Regulidae			
206	<i>Regulus regulus</i>	Goldcrest	II	LC	R, p, W
	PASSERIFORMES	Panuridae			
207	<i>Panurus biarmicus</i>	Bearded Tit	II	LC	R, S, W

Table 1e. Birds detected in Lake Seyfe wetland area (Aves)

No	Scientific name	Common name	Bern Convention Appendices	IUCN Red List Status	Status
	PASSERIFORMES	Aegithalidae			
208	<i>Aegithalos caudatus</i>	Long-tailed Tit	II	LC	R, p, W
	PASSERIFORMES	Paridae			
209	<i>Cyanistes caeruleus</i>	Eurasian Blue Tit	II	LC	R, W
210	<i>Parus major</i>	Great Tit	II	LC	R
	PASSERIFORMES	Sittidae			
211	<i>Sitta neumayer</i>	Rock Nuthatch	II	LC	R
	PASSERIFORMES	Certhiidae			
212	<i>Certhia brachydactyla</i>	Short-toed Treecreeper	II	LC	R
	PASSERIFORMES	Remizidae			
213	<i>Remiz pendulinus</i>	Eurasian Penduline Tit	III	LC	R, P, W
	PASSERIFORMES	Oriolidae			
214	<i>Oriolus oriolus</i>	Golden Oriole	II	LC	S, P
	PASSERIFORMES	Laniidae			
215	<i>Lanius collurio</i>	Red-backed Shrike	III	LC	S, P
216	<i>Lanius minor</i>	Lesser Grey Shrike	III	LC	S, P
217	<i>Lanius excubitor</i>	Great Grey Shrike	III	LC	W
	PASSERIFORMES	Corvidae			
218	<i>Garrulus glandarius</i>	Jay	-	LC	R
219	<i>Pica pica</i>	Magpie	-	LC	R
220	<i>Coloeus monedula</i>	Jackdaw	-	LC	R
221	<i>Corvus frugilegus</i>	Rook	-	LC	R, W
222	<i>Corvus corone</i>	Carrion Crow	-	LC	R
	PASSERIFORMES	Sturnidae			
223	<i>Sturnus vulgaris</i>	Starling	-	LC	R, W
224	<i>Pastor roseus</i>	Rose-coloured Starling	II	LC	s, P
	PASSERIFORMES	Passeridae			
225	<i>Passer domesticus</i>	House Sparrow	-	LC	R
226	<i>Passer hispaniolensis</i>	Spanish Sparrow	III	LC	S, P, w
227	<i>Passer montanus</i>	Tree Sparrow	III	LC	R
228	<i>Petronia petronia</i>	Rock Sparrow	II	LC	R
	PASSERIFORMES	Fringillidae			
229	<i>Fringilla coelebs</i>	Chaffinch	III	LC	R, P, W
230	<i>Fringilla montifringilla</i>	Brambling	III	LC	P, W
231	<i>Serinus serinus</i>	Serin	II	LC	R
232	<i>Chloris chloris</i>	European Greenfinch	II	LC	R, P, W
233	<i>Carduelis carduelis</i>	Greenfinch	II	LC	R, P, W
234	<i>Spinus spinus</i>	Eurasian Siskin	II	LC	r, P, W
235	<i>Linaria cannabina</i>	Common Linnet	II	LC	R, P, W
236	<i>Rhodopechys sanguineus</i>	Eurasian Crimson-winged Finch	III	LC	S, w
	PASSERIFORMES	Emberizidae			
237	<i>Emberiza citrinella</i>	Yellowhammer	II	LC	r, P, W
238	<i>Emberiza cia</i>	Rock Bunting	II	LC	R
239	<i>Emberiza hortulana</i>	Ortolan Bunting	III	LC	S, P
240	<i>Emberiza schoeniclus</i>	Black-faced Bunting	II	LC	R, P, W
241	<i>Emberiza melanocephala</i>	Black-headed Bunting	II	LC	S, P
242	<i>Miliaria calandra</i>	Corn Bunting	III	LC	R, P, W

(CR: Critically Endangered, EN: Endangered, VU: Vulnerable, NT: Near Threatened, LC: Least Concern); (R: Resident, S: Summer Migrant, W: Winter Visitor, P: Passage Migrant, r: Rare Resident, s: Rare Summer Migrant, w: Rare Winter Visitor, p: Rare passage Migrant, V: Vagrant)

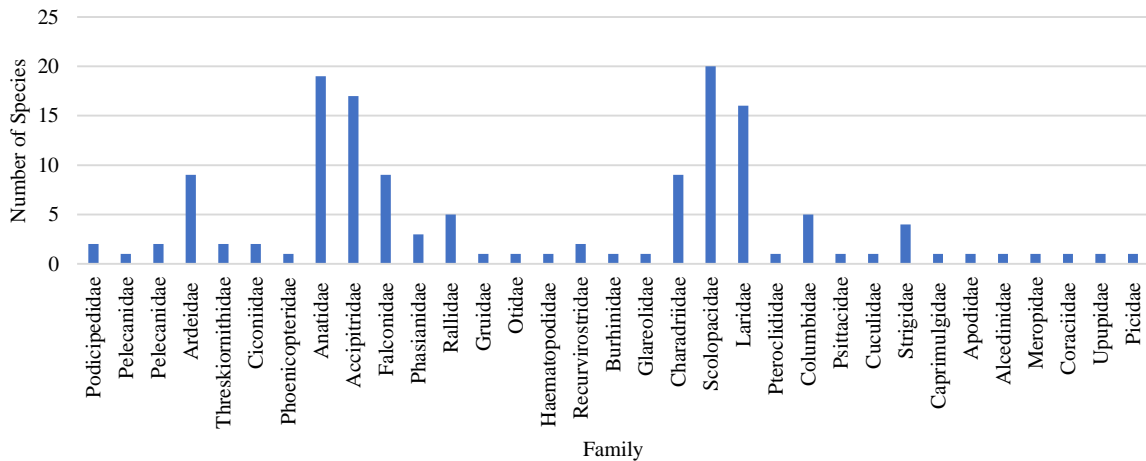


Figure 2. Distribution of non-passerine families

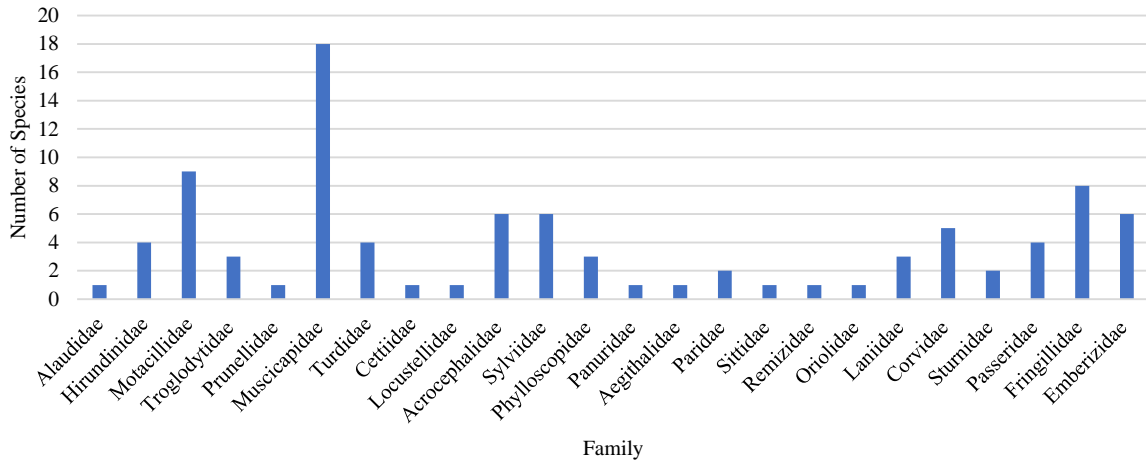


Figure 3. Distribution of passerine families

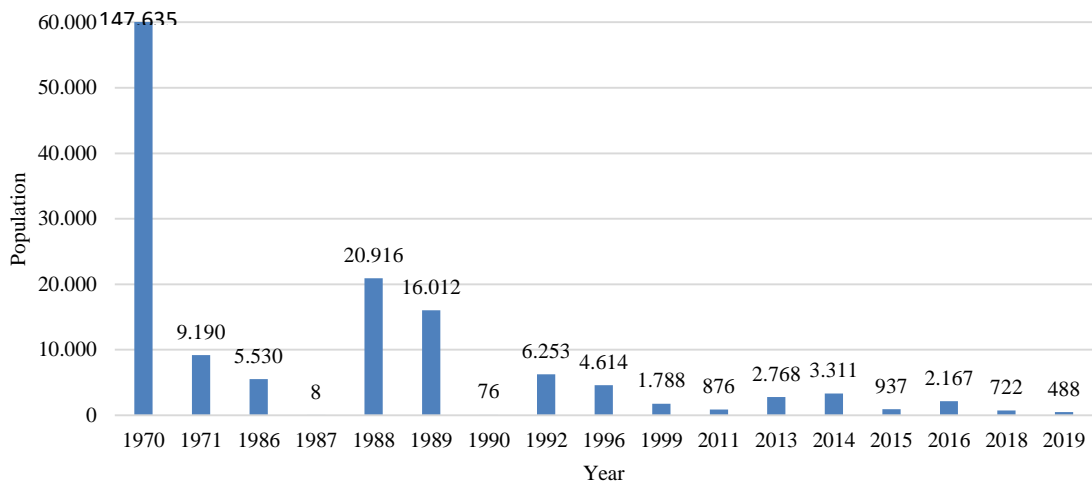


Figure 4. Midwinter waterfowl Census Results by Years

Table 2. Bird species that are globally endangered according to IUCN red list criteria

No	Scientific name	Common name	IUCN Red List Status
1	<i>Numenius tenuirostris</i>	Slender-billed Curlew	CR
2	<i>Neophron percnopterus</i>	Egyptian Vulture	EN
3	<i>Aquila nipalensis</i>	Steppe Eagle	EN
4	<i>Falco cherrug</i>	Saker	EN
5	<i>Branta ruficollis</i>	Red-breasted Goose	VU
6	<i>Marmaronetta angustirostris</i>	Marbled Duck	VU
7	<i>Aythya ferina</i>	Pochard	VU
8	<i>Aquila heliaca</i>	Imperial Eagle	VU
9	<i>Otis tarda</i>	Great Bustard	VU
10	<i>Streptopelia turtur</i>	Turtle Dove	VU
11	<i>Pelecanus crispus</i>	Dalmatian Pelican	NT
12	<i>Aythya nyroca</i>	Ferruginous Duck	NT
13	<i>Circus macrourus</i>	Pallid Harrier	NT
14	<i>Falco vespertinus</i>	Red-footed Falcon	NT
15	<i>Haematopus ostralegus</i>	Oystercatcher	NT
16	<i>Vanellus vanellus</i>	Lapwing	NT
17	<i>Calidris ferruginea</i>	Curlew Sandpiper	NT
18	<i>Limosa limosa</i>	Black-tailed Godwit	NT
19	<i>Limosa lapponica</i>	Bar-tailed Godwit	NT
20	<i>Numenius arquata</i>	Curlew	NT
21	<i>Larus armenicus</i>	Armenian Gull	NT
22	<i>Anthus pratensis</i>	Meadow Pipit	NT
23	<i>Turdus iliacus</i>	Redwing	NT

Regarding the results of the midwinter waterfowl census conducted between 1970 and 2019, the highest census was in 1970, with 147,635 birds whereas the lowest observation was made in 1987, with 8 birds. In 1988 and 1989, the researcher also took part in the Midwinter Waterfowl Census team, thus reaching a high number.

Of the species identified at the site, the ones that are globally endangered according to IUCN criteria are given in Table 2 (DKMP, 2018).

Conclusion

While there are 937 bird species in Palaearctic Region, 463 bird species located in Turkey (BirdLife International 2008, Kirwan et al. 2008, Kaya 2015). 49.4% of the bird species of the Palearctic Region have seen in Turkey. Lake Seyfe is hosting 242 bird species, which correspond to 52% of bird species in Turkey.

Between 1988-2019, a total of 242 bird species belonging to 26 orders and 57 families were recorded in Lake Seyfe. 20 of these are globally endangered species according to IUCN red list Criteria. The studies conducted so far revealed that the number of bird species recorded in Lake Seyfe and its vicinity in different years decreases day by day. Studies have shown that in addition to the decrease in the number of species, there is also a decrease in the population of the species. The major reason for this is thought to be the changes in water levels due to water regimes in the basin. The rise in water caused by the fall of the rainfall into the basin after drought created an impression that the lake was restored; but this was a misconception, the rapid withdrawal of lake water with the stopping of rain indicates that the improvement was temporary (Management Plan, 2011-2015). At the same time, it is thought that the decreases may be due to general climate change. It is stated in the literature that global warming and global climate change have been seen to have a negative impact on ecosystems and species with the deterioration of natural tissue since 1980s (Demir, 2009).

Today, it is known that 3% of the defined waterbird population has disappeared since the 17th century, 38% has decreased and only 20% has increased (Wetlands International, 2012). Therefore, it is important to identify endangered habitats and establish conservation priorities in order to protect waterbirds populations and increase their number. In other words, habitats that are sensitive to anthropogenic effects such as wetlands are extremely important for both waterbirds and other living things (Özkoç et al. 2019).

Seyfe Lake and its basin are under the pressure of many environmental factors such as domestic waste, agriculture and animal husbandry activities and hunting (Kıymaz 2010). The most important of these problems is the direct and indirect effects of human activities. All these problems cause negative effects on bird species and their populations in Lake Seyfe.

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