The Avifauna of Lake Seyfe#

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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, 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.

Keywords:
Lake Seyfe
Avifauna
Wetlands
Birds
Fauna

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 (Yiğitbaşoğlu, 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; Gümüşkümbet, Kızıldağ, Budak, Yazıkınik, 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 (Yiğitbaşoğlu, 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).

Studies Concerning the Avifauna of the Lake Conducted So Far

- “Birds of Turkey: Seyfe Lake” published by Husband and Kasparek (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; Kusbanks 2010; T.C. Çevre Bakanlığı, Kiş Ortaşı Su Kuşu Sayımları, 1992, 2014, 2015, 2016, 2018, 2019; WIWO Report 1986, 1988).

Waterfowl on the surface of the lake were mostly counted over Kâle 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 towed 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, Kiş Ortaşı 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 onocrotalas) also breed 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 Eskidöğan 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 be breeding (Çobanoğlu, 2000). Lake Seyfe was assessed as an “Important Bird Area (IBA)” by Magnin and Yarar (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 Yarar (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; Accipitriformes 17, FALCONIFORMES; Falconidae 9, GALLIFORMES; Phasianidae 3, GRUIFORMES; Gruidae 1, OTIDIFORMES; Otidae 1, CHARADRIIFORMES; Haematopodidae 1, Recurvirostridae 2, Burhinidae 1, Glareolidae 1, Charadriidae 9, Scolopacidae 20, Laridae 16, PTEROCLIFORMES; Pteroclidae 1, COLUMBIIFORMES; 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, Fringillidae 8, Musicapidae 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, Kiş Ortaşı Su Kuşu Sayımları, 2018, 2019).
| No | Scientific name | Common name | Bern Convention Appendices | IUCN Red List Status | Status |
|----|----------------|-------------|-----------------------------|----------------------|--------|
| 1  | Podiceps cristatus | Great Crested Grebe | III | LC | R, W |
| 2  | Phalacrocoracidae | Pygmy Cormorant | II | LC | R, w |
| 3  | Pelecanus onocrotalus | White Pelican | II | LC | s, P, w |
| 4  | Pelecanus crispus | Dalmatian Pelican | II | NT | R, W |
| 5  | Ardea cinerea | Little Egret | II | LC | s, p, w |
| 6  | Ardea alba | Great White Egret | II | LC | R, P, W |
| 7  | Ardea purpurea | Purple Heron | II | LC | S, P |
| 8  | Podiceps cristatus | Great Crested Grebe | III | LC | R, W |
| 9  | Phoenicopterus roseus | Greater Flamingo | II | LC | R, S, W |
| 10 | Cygnus cygnus | Whooper Swan | II | LC | W |
| 11 | Anser fabalis | Bean Goose | III | LC | V |
| 12 | Anser albifrons | White-fronted Goose | III | LC | p, W |
| 13 | Anser anser | Greylag Goose | III | LC | R, W |
| 14 | Branta ruficollis | Red-breasted Goose | II | VU | w |
| 15 | Tadorna ferruginea | Ruddy Shelduck | II | LC | R, W |
| 16 | Tadorna tadorna | Shelduck | II | LC | R, W |
| 17 | Anas strepera | Gadwall | III | LC | R, W |
| 18 | Anas clypeata | Shoveler | III | LC | r, P, W |
| 19 | Marmaronetta angusirostris | Marbled Duck | II | VU | S, w |
| 20 | Netta rufina | Red-crested Pochard | III | LC | R, W |
| 21 | Aythya ferina | Pochard | II | VU | R, P, W |
| 22 | Aythya nyroca | Ferruginous Duck | III | NT | R, P, W |
| 23 | Aythya fuligula | Tufted Duck | III | LC | R, P, W |
| 24 | Neophron percnopterus | Egyptian Vulture | III | EN | S, P |
| 25 | Circus macrourus | Pallid Harrier | III | NT | s, P, w |
| 26 | Circus pygargus | Montagu’s Harrier | III | LC | S, P |
| 27 | Buteo buteo | Buzzard | III | LC | R, P, W |
| 28 | Aquila pomarina | Booted Eagle | III | LC | s, P |
| 29 | Aquila nipalensis | Steppe Eagle | III | EN | s, P |
| 30 | Aquila heliaca | Imperial Eagle | III | VU | R, P, W |
| 31 | Aquila chrysaetos | Golden Eagle | III | LC | R |
| 32 | Hieraaetus pennatus | Raptor | 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 | Falco naumanii           | Lesser Kestrel       | II                        | LC                   | S, p    |
| 57 | Falco tinnunculus        | Kestrel              | II                        | LC                   | R, P, W |
| 58 | Falco vespertinus        | Red-footed Falcon    | II                        | NT                   | P       |
| 59 | Falco columbarius        | Merlin               | II                        | LC                   | p, W    |
| 60 | Falco sabutoco           | Hobby                | II                        | LC                   | S, P    |
| 61 | Falco eleonora           | Eleonora’s Falcon    | II                        | LC                   | S, P    |
| 62 | Falco biarmicus          | Lanner               | II                        | LC                   |         |
| 63 | Falco cherrug            | Saker                | II                        | EN                   | R, p, w |
| 64 | Falco peregrinus         | Peregrine            | II                        | LC                   | R, P, W |
| 65 | Alectoris chukar         | Chukar               | III                       | LC                   | R       |
| 66 | Perdix perdix            | Grey Partridge       | III                       | LC                   | R       |
| 67 | Coturnix coturnix        | Quail                | III                       | LC                   | S, P, W |
| 68 | Rallus aquaticus         | Water Rail           | III                       | LC                   | R, W    |
| 69 | Porzana porzana          | Spotted Crake        | II                        | LC                   | s, P, w |
| 70 | Porzana parva            | Little Crake         | II                        | LC                   | s, P    |
| 71 | Gallinula chloropus      | Moorhen              | III                       | LC                   | R, P, W |
| 72 | Falco atra               | Coot                 | III                       | LC                   | R, W    |
| 73 | Grus grus                | Crane                | II                        | LC                   | S, P, W |
| 74 | Otis tarda               | Great Bustard        | II                        | VU                   | R, w    |
| 75 | Haematopus ostralegus    | Oystercatcher        | III                       | NT                   | R, S, P, W |
| 76 | Himantopus himantopus    | Black-winged Stilt  | II                        | LC                   | S, w    |
| 77 | Recurvirostra avosetta   | Avocet               | II                        | LC                   | R, W    |
| 78 | Burhinus oedicnemus      | Stone-curlew         | II                        | LC                   | S, p    |
| 79 | Glareola pratincola      | Collared Pratincole  | II                        | LC                   | S, p    |
| 80 | Charadrius dubius        | Little Ringed Plover | II                        | LC                   | S, P    |
| 81 | Charadrius hiaticula     | Ringed Plover        | II                        | LC                   | P, W    |
| 82 | Charadrius alexandrinus  | Kentish Plover       | II                        | LC                   | R, S, W |
| 83 | Charadrius leschenaultii | Greater sand Plover  | II                        | LC                   | S, p    |
| 84 | Charadrius morinellus    | Dotterel             | II                        | LC                   | P       |
| 85 | Pluvialis apricaria      | Golden Plover        | III                       | LC                   | P, W    |
| 86 | Pluvialis squatarola     | Grey Plover          | III                       | LC                   | P, W    |
| 87 | Vanellus spinosus        | Spur-winged Plover   | II                        | LC                   | S       |
| 88 | Vanellus vanellus        | Lapwing              | III                       | NT                   | R, W    |
| 89 | Calidris minuta          | Little Stint         | II                        | LC                   | P, W    |
| 90 | Calidris temminckii      | Temminck’s Stint     | II                        | LC                   | P, w    |
| 91 | Calidris ferruginea      | Curlew Sandpiper     | II                        | NT                   | P, w    |
| 92 | Calidris alpina          | Dunlin               | II                        | LC                   | P, W    |
| 93 | Philemochus pugnax       | Ruff                 | III                       | LC                   | P, W    |
| 94 | Gallinago gallinago      | Snipe                | III                       | LC                   | P, W    |
| 95 | Scolopax rusticola       | Woodcock             | III                       | LC                   | P, W    |
| 96 | Limosa lapponica         | Black-tailed Godwit  | III                       | NT                   | P, W    |
| 97 | Limosa korensis          | Bar-tailed Godwit    | III                       | NT                   | p, w    |
| 98 | Numenius phaeopus        | Whimbrel             | III                       | LC                   | P       |
| 99 | Numenius temarirostris   | Slender-billed Curlew| II                        | CR                   | V       |
| 100| Numenius arquata         | Curlew               | III                       | NT                   | P, W    |
| 101| Tringa erythropus        | Spotted Redshank     | III                       | LC                   | P, W    |
| 102| Tringa totanus           | Redshank             | III                       | LC                   | S, P, W |
| 103| Tringa stagnatilis       | Marsh Sandpiper      | II                        | LC                   | P       |
| 104| Tringa nebulosa          | Greenshank           | III                       | LC                   | P, W    |
| 105| Tringa ochropus          | Green Sandpiper      | II                        | LC                   | s, P, W |
| 106| Tringa glareola          | Wood Sandpiper       | II                        | LC                   | P       |
| 107| Actitis hypoleucos       | Common Sandpiper     | II                        | LC                   | S, P, W |
| 108| Arenaria interpres       | Turnstone            | II                        | LC                   | P, w    |
| No | Scientific name | Common name | Bern Convention Appendices | IUCN Red List Status | Status |
|----|----------------|-------------|---------------------------|----------------------|--------|
| 109 | Ichthyaetus ichthyaetus | Great Black-headed Gull | III | LC | W |
| 110 | Ichthyaetus melanocephalus | Mediterranean Gull | II | LC | S, P, W |
| 111 | Hydrocoloeus minutus | Little Gull | II | LC | P, W |
| 112 | Chroicocephalus ridibundus | Black-headed Gull | III | LC | r, W |
| 113 | Chroicocephalus genei | Slender-billed Gull | II | LC | S, p, W |
| 114 | Larus canus | Common Gull | III | LC | W |
| 115 | Larus armenicus | Armenian Gull | III | NT | R, W |
| 116 | Larus cachinnans | Caspian Gull | LC | LC | W |
| 117 | Larus michahellis | Yellow-legged Gull | III | LC | R, W |
| 118 | Larus marinus | Great Black-backed Gull | III | LC | V |
| 119 | Gelochelidon nilotica | Gull-billed Tern | II | LC | S, P |
| 120 | Sterna hirundo | Common Tern | II | LC | S, P |
| 121 | Sterna albifrons | Little Tern | II | LC | S, P |
| 122 | Chlidonias hybridus | Whiskered Tern | II | LC | S, P, w |
| 123 | Chlidonias niger | Black Tern | II | LC | S, P |
| 124 | Chlidonias leucopterus | White-winged Black Tern | II | LC | S, P |
| 125 | Pterocles orientalis | Black-bellied Sandgrouse | II | LC | S, w |
| 126 | Columba livia | Rock Dove | III | LC | R |
| 127 | Columba oenas | Stock Dove | III | LC | r, P, W |
| 128 | Columba palumbus | Woodpigeon | - | LC | R, P, W |
| 129 | Streptopelia decaocto | Collared Dove | III | LC | R |
| 130 | Streptopelia turtur | Turtle Dove | III | VU | S, P |
| 131 | Psittacula krameri | Ring-necked parakeet | III | LC | R |
| 132 | Cuculus canorus | Cuckoo | III | LC | S, P |
| 133 | Onus scopos | Scops Owl | II | LC | S, w |
| 134 | Athene noctua | Little Owl | II | LC | R |
| 135 | Asio otus | Long-eared Owl | II | LC | R, W |
| 136 | Asio flammeus | Short-eared Owl | II | LC | r, W |
| 137 | Caprimulgus europaeus | Nightjar | II | LC | S, P |
| 138 | Apus apus | Swift | III | LC | S, P |
| 139 | Alcedo atthis | Kingfisher | II | LC | r, P, W |
| 140 | Merops apiaster | Bee-eater | III | LC | S, P |
| 141 | Coracias garrulus | Roller | II | LC | S, P |
| 142 | Upupa epops | Hoopoe | II | LC | S, P |
| 143 | Jynx torquilla | Wryneck | III | LC | s, P, w |
| 144 | Dendrocopos syriacus | Syrian Woodpecker | II | LC | R |
| 145 | Melanocorypha calandra | Clanda Lark | II | LC | R |
| 146 | Melanocorypha bimaculata | Bimaculated Lark | II | LC | S, p |
| 147 | Calandrella brachydactyla | Short-toed Lark | II | LC | S, P |
| 148 | Calandrella rufescens | Lesser Short-toed Lark | II | LC | S, w |
| 149 | Galerida cristata | Crested Lark | III | LC | R |
| 150 | Alauda arvensis | Skylark | III | LC | R, P, W |
| 151 | Eremophila alpestris | Shore Lark | II | LC | R, W |
| 152 | Riparia riparia | Sand Martin | II | LC | S, P |
| 153 | Hirundo rustica | Swallow | II | LC | S, P |
| 154 | Cercops daurica | Red-rumped Swallow | II | LC | S, P |
| 155 | Delichon urbicum | 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 |
|----|----------------|-------------|---------------------------|----------------------|--------|
| 156 | *Passeriformes* | Motacillidae | II | LC | S, P |
| 157 | *Anthus campestris* | Tawny Pipit | II | LC | S, P |
| 158 | *Anthus trivialis* | Tree Pipit | II | LC | S, P |
| 159 | *Anthus pratensis* | Meadow Pipit | II | NT | P, W |
| 160 | *Anthus cervinus* | Red-throated Pipit | II | LC | P, w |
| 161 | *Motacilla flava* | Yellow Wagtail | II | LC | S, P |
| 162 | *Motacilla cinerea* | Grey Wagtail | II | LC | R, P, W |
| 163 | *Motacilla alba* | Pied Wagtail | II | LC | R, P, W |
| 155 | *Passeriformes* | Trogloidyidae | | | |
| 164 | *Troglodytes troglodytes* | Wren | II | LC | R, W |
| 165 | *Prunella modularis* | Dunnock | II | LC | r, P, W |
| 166 | *Saxicola rubetra* | Whinchat | II | LC | R, P |
| 167 | *Saxicola torquatus* | Stonechat | II | LC | R, W |
| 168 | *Oenanthe isabellina* | Isabelline Wheatear | II | LC | S, P |
| 169 | *Oenanthe oenanthe* | Northern Wheatear | III | LC | S, P |
| 170 | *Luscinia svecica* | Bluethroat | II | LC | S, P |
| 171 | *Tabanus palustris* | White-throated Robin | II | LC | S |
| 172 | *Phoenicurus ochruros* | Black Redstart | II | LC | R, P, W |
| 173 | *Phoenicurus phoenicurus* | Redstart | II | LC | R, P |
| 174 | *Saxicola rubetra* | Whinchat | II | LC | R, P |
| 175 | *Saxicola torquatus* | Stonechat | II | LC | R, W |
| 176 | *Oenanthe isabellina* | Isabelline Wheatear | II | LC | S, P |
| 177 | *Oenanthe oenanthe* | Northern Wheatear | III | LC | S, P |
| 178 | *Oenanthe pleschanka* | Pied Wheatear | II | LC | S, P |
| 179 | *Oenanthe hispanica* | Black-throated Wheatear | II | LC | S, P |
| 180 | *Oenanthe finschii* | Finsch’s Wheatear | II | LC | R, w |
| 181 | *Musricapidae* | Collared Flycatcher | II | LC | S, P |
| 182 | *Ficedula parva* | Red-breasted Flycatcher | II | LC | S, P |
| 183 | *Ficedula semitorquata* | Semi-collared Flycatcher | II | LC | S, P |
| 184 | *Ficedula albicollis* | Collared Flycatcher | II | LC | P |
| 185 | *Passeriformes* | Turdidae | | | |
| 186 | *Turdus merula* | Blackbird | II | LC | R, P, W |
| 187 | *Turdus pilaris* | Fieldfare | II | LC | R, P, W |
| 188 | *Turdus philomelos* | Song Thrush | II | LC | R, P, W |
| 189 | *Turdus iliacus* | Redwing | II | NT | P, W |
| 190 | *Passeriformes* | Cettiidae | | | |
| 191 | *Cetti cetti* | Cetti’s Warbler | II | LC | R, W |
| 192 | *Locustella luscinioides* | Savi’s Warbler | II | LC | S, P |
| 193 | *Passeriformes* | Acrocephalidae | | | |
| 194 | *Acrocephalus melanopogon* | Moustached Warbler | II | LC | R, P, W |
| 195 | *Acrocephalus scirpaceus* | Reed Warbler | II | LC | S, P |
| 196 | *Acrocephalus arundinaceus* | Great Reed Warbler | II | LC | R, P, W |
| 197 | *Iduna pallida* | Eastern Olivaceous Warbler | II | LC | S, P |
| 198 | *Hippolais olivetorum* | Olive-tree Warbler | II | LC | S, P |
| 199 | *Hippolais icterina* | Icterine Warbler | II | LC | S, P |
| 200 | *Passeriformes* | Sylviidae | | | |
| 201 | *Sylvia melanocephala* | Sardinian Warbler | II | LC | R, p, w |
| 202 | *Sylvia atricapilla* | Blackcap | II | LC | R, P, w |
| 203 | *Passeriformes* | Phylloscopidae | | | |
| 204 | *Phylloscopus sibilatrix* | Wood Warbler | II | LC | S, P |
| 205 | *Phylloscopus collybita* | Chiffchaff | II | LC | R, P, W |
| 206 | *Phylloscopus trochilus* | Willow Warbler | II | LC | P |
| 207 | *Regulus regulus* | Goldcrest | II | LC | R, P, W |
| 208 | *Passeriformes* | Panuridae | | | |
| 209 | *Panurus biarmicus* | Bearded Tit | II | LC | R, S, W |
### Table 1. Birds detected in Lake Seyfe wetland area (Aves)

| No | Scientific name | Common name | Bern Convention Appendices | IUCN Red List Status | Status |
|----|-----------------|-------------|----------------------------|----------------------|--------|
| 208 | Aegithalos caudatus | Long-tailed Tit | II | LC | R, p, W |
| 209 | Cyanistes caerules | Eurasian Blue Tit | II | LC | R, W |
| 210 | Parus major | Great Tit | II | LC | R |
| 211 | Sitta neumayer | Rock Nuthatch | II | LC | R |
| 212 | Certhia brachydactyla | Short-toed Treecreeper | II | LC | R |
| 213 | Remiz pendulinus | Eurasian Penduline Tit | III | LC | R, P, W |
| 214 | Oriolus oriolus | Golden Oriole | II | LC | S, P |
| 215 | Lanius collurio | Red-backed Shrike | III | LC | S, P |
| 216 | Lanius minor | Lesser Grey Shrike | III | LC | S, P |
| 217 | Lanius excubitor | Great Grey Shrike | III | LC | W |
| 218 | Garrulus glandarius | Jay | - | LC | R |
| 219 | Pica pica | Magpie | - | LC | R |
| 220 | Coloeus monedula | Jackdaw | - | LC | R |
| 221 | Corvus frugilegus | Rook | - | LC | R, W |
| 222 | Corvus corone | Carrion Crow | - | LC | R |
| 223 | Sturnus vulgaris | Starling | - | LC | R, W |
| 224 | Pastor roseus | Rose-coloured Starling | II | LC | s, P |
| 225 | Passer domesticus | House Sparrow | - | LC | R |
| 226 | Passer hispaniolensis | Spanish Sparrow | III | LC | S, P, w |
| 227 | Passer montanus | Tree Sparrow | III | LC | R |
| 228 | Petronia petronia | Rock Sparrow | III | LC | R |
| 229 | Fringilla coelebs | Chaffinch | III | LC | R, P, W |
| 230 | Fringilla montifringilla | Brambling | III | LC | P, W |
| 231 | Serinus serinus | Serin | II | LC | R |
| 232 | Chloris chloris | European Greenfinch | II | LC | R, P, W |
| 233 | Carduelis carduelis | Greenfinch | II | LC | R, P, W |
| 234 | Spinus spinus | Eurasian Siskin | II | LC | R, P, W |
| 235 | Linaria cannabina | Common Linnet | II | LC | R, P, W |
| 236 | Rhodopechys sanguineus | Eurasian Crimson-winged Finch | III | LC | S, w |
| 237 | Emberiza citrinella | Yellowhammer | II | LC | R, p, W |
| 238 | Emberiza cia | Rock Bunting | II | LC | R |
| 239 | Emberiza hortulana | Ortolan Bunting | III | LC | S, P |
| 240 | Emberiza schoeniclus | Black-faced Bunting | II | LC | R, P, W |
| 241 | Emberiza melanocephala | Black-headed Bunting | II | LC | S, P |
| 242 | Miliaria calandra | 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
Table 2. Bird species that are globally endangered according to IUCN red list criteria

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