

DOI : [http://doi.org/10.22438/jeb/38/5\(SI\)/GM-14](http://doi.org/10.22438/jeb/38/5(SI)/GM-14)

JEB™

ISSN: 0254-8704 (Print)  
ISSN: 2394-0379 (Online)  
CODEN: JEBIDP

## Bird diversity and conservation status in Isparta province (Turkey)

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### Key words

Bird diversity,  
Biodiversity,  
Conservation status,  
Isparta,  
Ornithofauna

### Publication Info

Paper received : 30.08.2016

Revised received : 20.06.2017

Accepted : 28.06.2017

### Abstract

**Aim :** With its wetland areas, forests, high mountains and other habitat varieties, Isparta Province hosts many bird species. Furthermore, it provides birds with the opportunity of relaxation, breeding and accommodation in both the migration season and the rest of the period in a year due to its highly favourable geographical position and wetland areas. For this reason, the migration route of Northwest-South, which a part of the research area of this study is located, has great importance.

**Methodology :** The species were determined by Line transect and Point counts method. Besides direct sighting and identification, the observations were made using some signs and traces belonging to birds such as footprints, faeces, voices, shape of wings and feathers.

**Results :** As a result of the field surveys performed during four different seasons (Winter-Spring-Summer-Autumn), total 60.120 individuals and 266 bird species were determined. The research carried out during the period between 2013 and 2014, and during the period, 85 species were identified in the field surveys of winter season, were categorized as 63 residents, 18 winter visitors, 3 summer visitors and 1 transit- winter visitor and while 83 of them were in the category of LC (Least Concern), one was located in the category of NT (Near Threatened) and 1 has been identified as VU (Vulnerable). During field surveys of spring season, 88 species consisted of 59 residents, 25 summer visitors and 4 transits, were categorized as 84 LC, 1 NT, 2 VU and one EN (Endangered), while total 115 species comprised 69 residents, 41 summer visitors, 4 transits and 1 transit-winter visitor were categorized as 113 LC, 1 VU and 1 EN during summer season. Including 68 resident, 6 winter visitors, 9 summer visitors, 2 transits, 2 transit-winter visitors and 1 resident-summer visitors, total 88 species were determined in the field surveys of the autumn season. Among them, 87 were located in the category of LC and one was identified as VU.

**Interpretation :** Kovada Lake National Park, Kızıldağ National Park, Gölçük Nature Park, Yazılı Canyon Nature Park, Başpınar Nature Park, Sığla Forest Nature Reserve Area in Kargı Village and Kasnak Meşesi Nature Reserve Area are located within the borders of Isparta. Destruction of natural habitats, due to agricultural practices and human activities occurring in those areas whereas other habitats, richness of bird species were affected. Eradication of these problems arising from human effect will be resolved with relevant conservation.



## Introduction

Due to its characteristics of being the crossroads of three continents, Turkey has quite a lot species diversity. It is also a bridge and a junction point in terms of biodiversity (Atalay and Efe, 2015). During the glacial periods, it became a major point as a refuge area for many species. It is even in the position of the centre of gene bank for some kind of species (Demirsoy, 1999). Turkey is one of the rare countries with respect to natural life. Turkey is dominated by different types of climate, mountain chains including different rock structures, plateaus and plains (Atalay, 2008). Two of the four bird migration routes in the Palearctic region pass through Turkey. The first of these is the Northwest-South route, which passes first from Thrace to the Straits and then to Anatolia. The second is the northeast-south path, which originates in the Eastern Black Sea Region to pass through the Çoruh River and extends to Eastern Anatolia (Yiğit *et al.*, 2008).

Depending upon its geographical position and habitat diversity, a total of 502 bird species including 437 regular and 65 random, have been observed in Turkey, which is located on the major migration routes (Kiziroğlu, 2008; Atalay and Efe, 2015).

Isparta province where the study was carried out is home to many birds with high mountains, wetlands, forests and other habitats. Also, it is one of the areas where migratory bird species can find suitable habitats during migration due to its geographical location.

## Materials and Methods

**Study area :** Isparta Province is located in the Lakes Zone situated in the North of the Mediterranean Region and the Western Taurus Mountains Zone. The geographic coordinates of the province lie between 30° 20'-31°33' E and 37°18'-38°30' N. Having 8.933 km<sup>2</sup> of total land area, Isparta is encompassed by Sultandağı, Çay, Şuhut, Dinar and Dazkırı districts of Afyon province Province from north and northwest while it borders Ağlasun, Bucak and Centre districts of Burdur Province in the south and southwest. From east and southeast, it is surrounded by Akşehir, Doğanhisar and Beyşehir districts of Konya province (Fig.1).

The field surveys were carried out in the relevant habitats after the literature review (Fig. 1). The areas, which were identified on the basis of suitability for the natural habitats of species, were selected to represent multiple habitats such as forest, high mountain, moorland, wetland, sand dune, farmland and settlement, etc. During the observations, species were determined through binoculars, telescope and SLR camera. The coordinates of the observation areas were specified with the help of Global Positioning System (GPS).

The species were determined by Line transect and Point counts method (Dobinson, 1976; Bibby and Burgess, 1992).

Besides direct sighting and identification, the observations were noted through some signs and traces belonging to birds such as footprints, faeces, voices, wing shapes and feathers. The observation methods applied were selected in accordance to the species.

## Results and Discussion

In the present study, which was carried out in Isparta/Turkey between 2013 and 2014, a total of 266 bird species belonging to 53 families were reported (Table 1). These species include 128 residents, 75 summer visitors, 38 winter visitors and 25 passage migrant (Fig.2).

According to the International Union for Conservation of Nature (IUCN), six of the identified species were considered as vulnerable (VU), one of them as endangered (EN) and the number of near threatening (NT) species were eight while 251 of them are under the low risk (LC) (Fig. 3, Table 1).

During the fields surveys performed during winter season, total 31723 individuals and 85 species were determined. Among them, *Fulicaatra* (Common coot) was placed on the top with 25293 (79.73%) birds, while the species having the highest number of individuals were *Phalacrocorax carbo* (Great cormorant) 2057 (6.48 %), *Aythya ferina* (common pochard) 531 (1.67 %), *Corvus cornix* (Hooded crow) 447 (1.41 %), *Passer domesticus* (house sparrow) 337 (1.06 %), *Ardea alba* (Great white egret) 289 (0.91 %), *Fringilla coelebs* (Eurasian chaffinch) 285 (0.90 %), *Ardea cinerea* (grey heron) 232 (0.73%) respectively.

During the spring field surveys, a total of 88 species and 2867 individuals were identified, *Hirundo rustica* and *Delichon urbicum* were determined as the species that had highest number of individuals with 21.24 % and 15.77 % respectively. In addition, *Neophron percnopterus* (Egyptian vulture) was among the endangered species with respect to IUCN status. The significance of the zone located on the northwest-south route was increased as the endangered or near threatened species were mostly observed in this circle comprising the area around Yalvaç and Şarkikaraağaç districts.

9088 birds and 115 species were identified over the course of the field surveys carried out during the summer season. Among these species having the highest number of individuals, *Hirundo rustica* (barn swallow) ranked first with 2071 individuals (22.79%), while the others were *Passer domesticus* (house sparrow) 929 (10.22 %), *Apus apus* (common swift) 868 (9.55 %) and 453(4.98 %) *Sturnus vulgaris* (common starling), respectively.

During the field surveys of autumn season, 16442 individuals and 88 species were determined. With a number of 9321 (56.69 %) individuals, the first place among the species

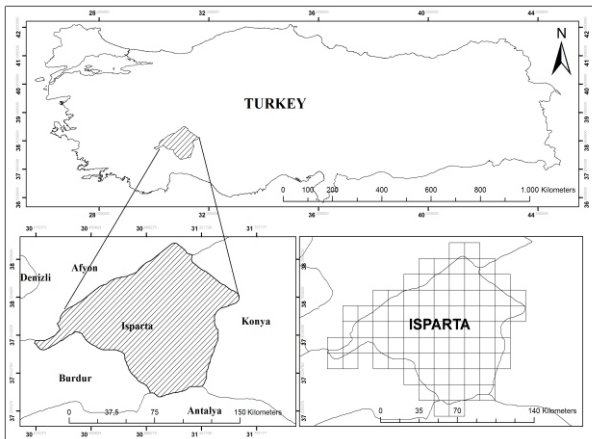


Fig. 1 : Location of study area

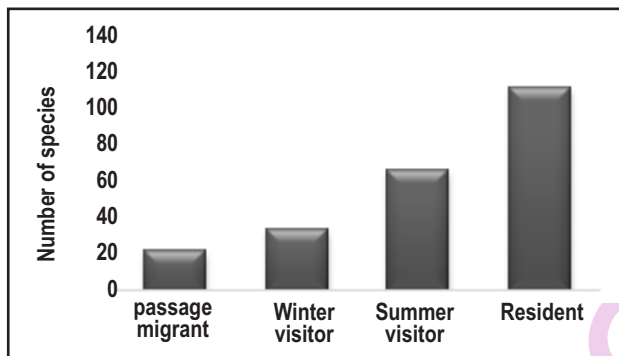


Fig. 2 : Movement patterns of birds in Isparta

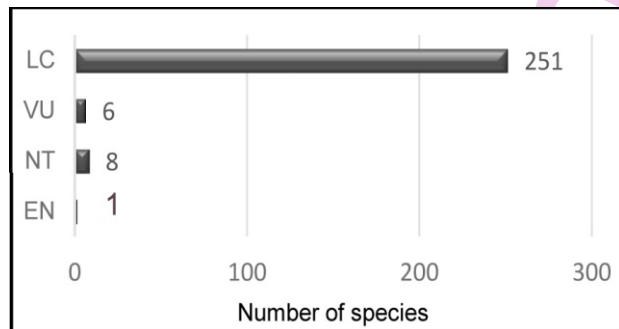


Fig. 3 : Status of birds in Isparta

having the highest number of individuals has been taken by *Fulica atra* (Common coot), which is followed by *Phalacrocorax carbo* (Great Cormorant) and *Sturnus vulgaris* (common starling) with 2068 (12.58 %) and 905 (5.50 %) individuals respectively. In the same period, *Gypaetus barbatus* (bearded vulture) has been identified as NT (near threatened species) and the areas, where this species was observed, has great importance for monitoring both the species and the field. When the distance from their nests situated in the Köprülü Canyon National Park located in the

Antalya province, were taken into consideration, preservation of this vulture species was found as inevitable.

Several ornithological studies were carried out in various times in Isparta province (Tabur, 2002; Gündoğdu, 2002; Tabur and Ayvaz, 2005; Tabur and Ayvaz, 2006a,b; Şimşekli *et al.*, 2011; Öztürk and Tabur, 2010; Öztürk and Tabur, 2013; Soylu and Tabur, 2015). However, these studies remained restricted in local areas and species studies. With this study, seasonal distribution of species was revealed through a broader determination of species and habitat.

Turkey is in the key position for many bird species. A wide range of bird species live in various ecosystems of Turkey. To maintain this richness, it is essential to understand the dimensions of diversity and to determine and take measures against substantial threats. In this context, several precautions at international and national level have been taken for the conservation of biological diversity and this is being done in the interest of large biodiversity of birds.

Birds are ideal bio-indicators (Rajashekara and Venkatesha, 2015). They are sensitive even to small environmental changes. For this reason, they are considered as a healthy indicator for the productivity of ecosystem and ecological conditions (Newton, 1995; Desai and Shanbhag, 2007; Li and Mundkur, 2007). It was identified from the literature that Tota mountain and the surrounding area, which is also one of the fields of this study was previously used as nesting site by five griffon vultures. Therefore, it has great importance to protect this species as the number of individuals and habitats are decreasing every passing day, even though they reproduce once a year. Through statistical analysis, it was found that the cause for this species to abandon Yazılı Canyon was the negative effects of marble quarries, which destroyed their breeding areas Öztürk and Tabur (2013). This was also the primary reason for individuals to settle into Tota Mountain and its surroundings. Thus, this habitat, which is far from threatening factors, is preferred by this species as a new breeding and perching place.

Comprising a part of the research area of this study, The northwest-south route passing from Thrace to the Straits and then to Anatolia has great importance. In addition, Isparta provides birds with the opportunity of relaxation, breeding and accommodation during both the migratory season and the rest of the period in a year thanks to its wetland areas. Habitat conservation of water bodies is most important for sustaining the population of migratory and other wetland birds (Arya *et al.*, 2014). Protection of species also means the conservation of the resources for ecotourism. Ross and Wall (1999) argue that appropriate management can provide balance between conservation and development by establishing a strong link between local residents and tourism. For this reason, problems arising from mining, which has been identified as a potential

Table 1: Bird species extending to Isparta and its surroundings with their features

Family	Scientific name	English name	Density	Movement patterns	IUCN	CITES	BERN	MAK	
Podicipedidae	<i>Podiceps cristatus</i>	Great Crested Grebe	Median	Resident	LC	-	Appendix III	OSBK	
	<i>Podiceps griseogen</i>	Red-necked Grebe	Rare	Summer visitor	LC	-	Appendix II	OSBK	
	<i>Podiceps nigricollis</i>	Black-necked Grebe	Rare	Winter visitor	LC	-	Appendix II	OSBK	
	<i>Tachybaptus ruficollis</i>	Little Grebe	Median	Resident	LC	-	Appendix II	OSBK	
Pelecanidae	<i>Pelecanus crispus</i>	Dalmatian Pelican	Rare	Resident	VU	Appendix-I	Appendix II	OSBK	
	<i>Phalacrocorax aristotelis</i>	European Shag	Rare	Resident	LC	-	Appendix II	OSBK	
Phalacrocoracidae	<i>Phalacrocorax carbo</i>	Great Cormorant	Common	Resident	LC	-	Appendix III	Appendix I	
	<i>Phalacrocorax pygmeus</i>	Pygmy Cormorant	Rare	Resident	LC	-	Appendix II	OSBK	
	<i>Ardea cinerea</i>	Grey Heron	Common	Resident	LC	-	Appendix III	Appendix I	
	<i>Ardea purpurea</i>	Purple Heron	Rare	Resident	LC	-	Appendix II	OSBK	
	<i>Ardeolar alioides</i>	Squacco Heron	Common	Passage migrant	LC	-	Appendix II	OSBK	
	<i>Ardea alba</i>	Great White Egret	Common	Resident	LC	-	Appendix II	OSBK	
	<i>Egretta garzetta</i>	Little Egret	Common	Resident	LC	-	Appendix II	OSBK	
	<i>Nycticorax nycticorax</i>	Black-crowned Night-heron	Rare	Summer visitor	LC	-	Appendix II	OSBK	
	<i>Bubulcus ibis</i>	Cattle Egret	Rare	Resident	LC	-	Appendix II	OSBK	
	<i>Ixobrychus minutus</i>	Common Little Bittern	Rare	Passage migrant	LC	-	Appendix II	OSBK	
	<i>Botaurus stellaris</i>	Eurasian Bittern	Median	Winter visitor	LC	-	Appendix II	OSBK	
	Ciconiidae	<i>Ciconia ciconia</i>	White Stork	Median	Summer visitor	LC	-	Appendix II	OSBK
		<i>Ciconia nigra</i>	Black Stork	Median	Summer visitor	LC	Appendix II	Appendix II	OSBK
	Threskiornithidae	<i>Platalea leucorodia</i>	Eurasian Spoonbill	Rare	Resident	LC	-	Appendix II	OSBK
<i>Plegadis falcinellus</i>		Glossy Ibis	Common	Passage migrant	LC	-	Appendix II	OSBK	
Phoenicopteridae	<i>Phoenicopterus roseus</i>	Greater Flamingo	Rare	Resident	LC	Appendix II	Appendix II	OSBK	
	<i>Cygnus olor</i>	Mute Swan	Rare	Resident	LC	-	Appendix III	OSBK	
Anatidae	<i>Anser anser</i>	Greylag Goose	Rare	Resident	LC	-	Appendix III	Appendix I	
	<i>Anser albifrons</i>	Greater White-fronted Goose	Rare	Winter visitor	LC	-	Appendix III	Appendix II	
	<i>Anser erythropus</i>	Lesser White-fronted Goose	Rare	Winter visitor	VU	-	Appendix II	OSBK	
	<i>Tadorna tadorna</i>	Common Shelduck	Rare	Resident	LC	-	Appendix II	OSBK	
	<i>Tadorna ferruginea</i>	Ruddy Shelduck	Common	Resident	LC	-	Appendix II	OSBK	
	<i>Anas platyrhynchos</i>	Mallard	Common	Resident	LC	-	Appendix III	Appendix II	
	<i>Anas crecca</i>	Common Teal	Common	Winter visitor	LC	-	Appendix III	Appendix II	
	<i>Anas acuta</i>	Northern Pintail	Rare	Resident	LC	-	Appendix III	Appendix II	
	<i>Anas clypeata</i>	Northern Shoveler	Rare	Winter visitor	LC	-	Appendix III	Appendix II	
	<i>Anas querquedula</i>	Garganey	Rare	Summer visitor	LC	-	Appendix III	Appendix II	
	<i>Anas strepera</i>	Gadwall	Rare	Resident	LC	-	Appendix III	Appendix II	
	<i>Anas penelope</i>	Eurasian Wigeon	Common	Winter visitor	LC	-	Appendix III	Appendix II	
	<i>Marmaronetta angustirostris</i>	Marbled Teal	Rare	Resident	VU	-	Appendix II	OSBK	
	<i>Nettion rufina</i>	Red-crested Pochard	Rare	Resident	LC	-	Appendix III	Appendix II	
Accipitridae	<i>Aythya ferina</i>	Common Pochard	Common	Resident	VU	-	Appendix III	Appendix II	
	<i>Aythya nyroca</i>	Ferruginous Duck	Rare	Resident	NT	-	Appendix III	OSBK	
	<i>Aythya fuligula</i>	Tufted Duck	Rare	Winter visitor	LC	-	Appendix III	Appendix II	
	<i>Haliaeetus albicilla</i>	White-tailed Sea-eagle	Rare	Resident	LC	Appendix-I	Appendix II	OSBK	

(Contd.)

<i>Milvus milvus</i>	Red Kite	Rare	Passage migrant	NT	Appendix II	OSBK
<i>Milvus migrans</i>	Black Kite	Rare	Resident	LC	Appendix II	OSBK
<i>Circus aeruginosus</i>	Short-toed Snake-eagle	Median	Resident	LC	Appendix II	OSBK
<i>Accipiter nisus</i>	Eurasian Sparrowhawk	Rare	Resident	LC	Appendix II	OSBK
<i>Accipiter gentilis</i>	Northern Goshawk	Rare	Resident	LC	Appendix II	OSBK
<i>Accipiter brevipes</i>	Levant Sparrowhawk	Rare	Summer visitor	LC	Appendix II	OSBK
<i>Circus aeruginosus</i>	Western Marsh-harrier	Median	Resident	LC	Appendix II	OSBK
<i>Circus cyaneus</i>	Hen Harrier	Rare	Winter visitor	LC	Appendix II	OSBK
<i>Circus macrourus</i>	Pallid Harrier	Rare	Summer visitor	NT	Appendix II	OSBK
<i>Circus pygargus</i>	Montagu's Harrier	Rare	Summer visitor	LC	Appendix II	OSBK
<i>Buteo rufinus</i>	Long-legged Buzzard	Median	Resident	LC	Appendix II	OSBK
<i>Buteo buteo</i>	Eurasian Buzzard	Median	Resident	LC	Appendix II	OSBK
<i>Hieraetus pennatus</i>	Booted Eagle	Rare	Passage migrant	LC	Appendix II	OSBK
<i>Hieraetus fasciatus</i>	Bonelli's Eagle	Rare	Resident	LC	Appendix II	OSBK
<i>Gypaetus barbatus</i>	Bearded Vulture	Rare	Resident	NT	Appendix II	OSBK
<i>Neophron percnopterus</i>	Egyptian Vulture	Rare	Resident	EN	Appendix II	OSBK
<i>Gyps fulvus</i>	Griffon Vulture	Median	Resident	LC	Appendix II	OSBK
<i>Aquila chrysaetos</i>	Golden Eagle	Median	Resident	LC	Appendix II	OSBK
<i>Aquila clanga</i>	Greater Spotted Eagle	Rare	Winter visitor	VU	Appendix II	OSBK
<i>Aquila pomarina</i>	Lesser Spotted Eagle	Rare	Passage migrant	LC	Appendix II	OSBK
<i>Pernis ptilorhynchus</i>	European Honey-buzzard	Rare	Summer visitor	LC	Appendix II	OSBK
<i>Pandion haliaetus</i>	Osprey	Rare	Summer visitor	LC	Appendix II	OSBK
<i>Falco tinnunculus</i>	Common Kestrel	Median	Resident	LC	Appendix II	OSBK
<i>Falco naumanni</i>	Lesser Kestrel	Rare	Summer visitor	LC	Appendix II	OSBK
<i>Falco peregrinus</i>	Peregrine Falcon	Rare	Resident	LC	Appendix I	OSBK
<i>Falco columbarius</i>	Merlin	Rare	Winter visitor	LC	Appendix II	OSBK
<i>Falco vesperinus</i>	Red-footed Falcon	Rare	Passage migrant	NT	Appendix II	OSBK
<i>Alectoris chukar</i>	Chukar	Median	Resident	LC	Appendix III	Appendix I
<i>Pedix perdis</i>	Grey Partridge	Rare	Resident	LC	Appendix III	Appendix I
<i>Coturnix coturnix</i>	Common Quail	-	Summer visitor	LC	Appendix III	Appendix I
<i>Rallus aquaticus</i>	Western Water Rail	Rare	Winter visitor	LC	Appendix III	Appendix I
<i>Porzana porzana</i>	Spotted Crane	Rare	Resident	LC	Appendix II	OSBK
<i>Gallinula chloropus</i>	Common Moorhen	Median	Resident	LC	Appendix III	Appendix I
<i>Fulica atra</i>	Common Coot	Common	Resident	LC	Appendix III	Appendix I
<i>Haematopus ostralegus</i>	Eurasian Oystercatcher	Rare	Passage migrant	NT	Appendix III	Appendix I
<i>Himantopus himantopus</i>	Black-winged Stilt	Median	Resident	LC	Appendix II	OSBK
<i>Recurvirostra avosetta</i>	Pied Avocet	Rare	Resident	LC	Appendix II	OSBK
<i>Charadrius dubius</i>	Little Ringed Plover	Common	Summer visitor	LC	Appendix II	OSBK
<i>Charadrius hiaticula</i>	Common Ringed Plover	Rare	Passage migrant	LC	Appendix II	OSBK
<i>Charadrius alexandrinus</i>	Kentish Plover	Rare	Passage migrant	LC	Appendix II	OSBK
<i>Vanellus vanellus</i>	Northern Lapwing	Rare	Winter visitor	LC	Appendix III	Appendix I
<i>Vanellus spinosus</i>	Spur-winged Lapwing	Rare	Winter visitor	LC	Appendix II	OSBK
<i>Actitis hypoleucos</i>	Common Sandpiper	Median	Summer visitor	LC	Appendix III	OSBK
<i>Arenaria interpres</i>	Ruddy Turnstone	Rare	Passage migrant	LC	Appendix II	OSBK
<i>Calidris minuta</i>	Little Stint	Rare	Passage migrant	LC	Appendix II	OSBK

(Contd.)

<i>Callidris alpina</i>	Dunlin	Rare	Winter visitor	LC	-	Appendix III	OSBK
<i>Calidris alba</i>	Sanderling	Rare	Passage migrant	LC	-	Appendix II	OSBK
<i>Tringa totanus</i>	Common Redshank	Rare	Passage migrant	LC	-	Appendix III	Appendix I
<i>Tringa erythropus</i>	Spotted Redshank	Rare	Winter visitor	LC	-	Appendix III	Appendix I
<i>Tringa nebularia</i>	Common Greenshank	Rare	Passage migrant	LC	-	Appendix III	OSBK
<i>Tringa stagnatilis</i>	Marsh Sandpiper	Rare	Passage migrant	LC	-	Appendix II	OSBK
<i>Tringa glareola</i>	Wood Sandpiper	Rare	Passage migrant	LC	-	Appendix II	OSBK
<i>Tringa chropus</i>	Green Sandpiper	Rare	Passage migrant	LC	-	Appendix II	OSBK
<i>Numenius arquata</i>	Eurasian Curlew	Rare	Winter visitor	NT	-	Appendix III	Appendix I
<i>Limosa limosa</i>	Black-tailed Godwit	Rare	Passage migrant	NT	-	Appendix III	OSBK
<i>Scolopax rusticola</i>	Eurasian Woodcock	-	Winter visitor	LC	-	Appendix III	Appendix II
<i>Gallinago gallinago</i>	Common Snipe	Rare	Winter visitor	LC	-	Appendix III	Appendix II
<i>Burhinus oedicnemus</i>	Eurasian Thick-knee	-	Summer visitor	LC	-	Appendix II	OSBK
<i>Glareola pratincola</i>	Collared Pratincole	Rare	Passage migrant	LC	-	Appendix II	OSBK
<i>Larus melanocephalus</i>	Mediterranean Gull	Rare	Resident	LC	-	Appendix II	OSBK
<i>Larus ridibundus</i>	Black-headed Gull	Rare	Winter visitor	LC	-	Appendix III	Appendix I
<i>Larus genei</i>	Slender-billed Gull	Rare	Winter visitor	LC	-	Appendix II	OSBK
<i>Larus canus</i>	Mew Gull	Rare	Winter visitor	LC	-	Appendix I	Appendix I
<i>Larus fuscus</i>	Lesser Black-backed Gull	Rare	Winter visitor	LC	-	Appendix I	Appendix I
<i>Larus cachinnans</i>	Caspian Gull	Median	Winter visitor	LC	-	Appendix III	Appendix I
<i>Larus armenicus</i>	Armenian Gull	Common	Resident	LC	-	Appendix III	Appendix I
<i>Larus michahellis</i>	Yellow-legged Gull	Common	Resident	LC	-	Appendix III	Appendix I
<i>Chlidonias hybridus</i>	Whiskered Tern	Rare	Summer visitor	LC	-	Appendix II	OSBK
<i>Sterna nilotica</i>	Common Gull-billed	Rare	Summer visitor	LC	-	Appendix III	OSBK
<i>Sterna hirsundo</i>	Common Tern	Rare	Summer visitor	LC	-	Appendix II	OSBK
<i>Columba livia</i>	Rock Dove	Common	Resident	LC	-	Appendix III	Appendix II
<i>Columba oenas</i>	Stock Dove	Rare	Resident	LC	-	Appendix III	Appendix II
<i>Columba palumbus</i>	Common Woodpigeon	Common	Winter visitor	LC	-	Appendix III	Appendix II
<i>Streptopelia decaocto</i>	Eurasian Collared-dove	Common	Resident	LC	-	Appendix III	Appendix I
<i>Streptopelia turtur</i>	European Turtle-dove	Median	Summer visitor	VU	-	Appendix III	Appendix II
<i>Cuculus canorus</i>	Common Cuckoo	Rare	Summer visitor	LC	-	Appendix III	OSBK
<i>Bubo bubo</i>	Eurasian Eagle-owl	Rare	Resident	LC	-	Appendix II	OSBK
<i>Asio otus</i>	Northern Long-eared Owl	-	Resident	LC	-	Appendix II	OSBK
<i>Otus scops</i>	Eurasian Scops-owl	Rare	Resident	LC	-	Appendix II	OSBK
<i>Athene noctua</i>	Little Owl	Median	Resident	LC	-	Appendix II	OSBK
<i>Tyto alba</i>	Common Barn-owl	-	Resident	LC	-	Appendix II	OSBK
<i>Caprimulgus europaeus</i>	European Nightjar	Rare	Summer visitor	LC	-	Appendix II	OSBK
<i>Apus apus</i>	Common Swift	Common	Summer visitor	LC	-	Appendix III	OSBK
<i>Apus melba</i>	Alpine Swift	Median	Summer visitor	LC	-	Appendix II	OSBK
<i>Alcedo atthis</i>	Common Kingfisher	Median	Resident	LC	-	Appendix II	OSBK
<i>Merops apiaster</i>	European Bee-eater	Median	Resident	LC	-	Appendix II	OSBK
<i>Merops superciliosus</i>	Olive Bee-eater	Rare	Summer visitor	LC	-	Appendix III	OSBK
<i>Coracias garrulus</i>	European Roller	Rare	Summer visitor	LC	-	Appendix II	OSBK
<i>Upupa epops</i>	Common Hoopoe	Median	Summer visitor	LC	-	Appendix II	OSBK
<i>Picus viridis</i>	Eurasian Green Woodpecker	Rare	Resident	LC	-	Appendix II	OSBK

(Contd.)

	<i>Dendrocopos major</i>	Great Spotted Woodpecker	Rare	Resident	LC	-	Appendix II	OSBK
	<i>Dendrocopos syriacus</i>	Syrian Woodpecker	Rare	Resident	LC	-	Appendix II	OSBK
	<i>Dendrocopos medius</i>	Middle Spotted Woodpecker	-	Resident	LC	-	Appendix II	OSBK
	<i>Dendrocopos minor</i>	Lesser Spotted Woodpecker	Rare	Resident	LC	-	Appendix II	OSBK
Alaudidae	<i>Melanocorypha calandra</i>	Calandra Lark	Rare	Resident	LC	-	Appendix II	OSBK
	<i>Melanocorypha bimaculata</i>	Bimaculated Lark	Rare	Summer visitor	LC	-	Appendix II	OSBK
	<i>Calandrella brachydactyla</i>	Greater Short-toed Lark	Rare	Summer visitor	LC	-	Appendix II	OSBK
	<i>Calandrella rufescens</i>	Lesser Short-toed Lark	Rare	Resident	LC	-	Appendix II	OSBK
	<i>Galerida cristata</i>	Crested Lark	Common	Resident	LC	-	Appendix III	Appendix I
	<i>Lullula arborea</i>	Wood Lark	Rare	Resident	LC	-	Appendix III	Appendix I
	<i>Auda arvensis</i>	Eurasian Skylark	Rare	Winter visitor	LC	-	Appendix III	Appendix I
	<i>Eremophila alpestris</i>	Horned Lark	Rare	Resident	LC	-	Appendix II	OSBK
	<i>Hirundo rustica</i>	Barn Swallow	Common	Summer visitor	LC	-	Appendix II	OSBK
	<i>Hirundo daurica</i>	Red-rumped Swallow	Rare	Summer visitor	LC	-	Appendix II	OSBK
<i>Hirundo rupestris</i>	Eurasian Crag-martin	Common	Summer visitor	LC	-	Appendix II	OSBK	
<i>Riparia riparia</i>	Sand Martin	Common	Summer visitor	LC	-	Appendix II	OSBK	
<i>Delichon urbicum</i>	Northern House-martin	Common	Summer visitor	LC	-	Appendix II	OSBK	
Motacillidae	<i>Anthus campestris</i>	Tawny Pipit	Rare	Summer visitor	LC	-	Appendix II	OSBK
	<i>Anthus trivialis</i>	Tree Pipit	-	Summer visitor	LC	-	Appendix II	OSBK
	<i>Anthus pratensis</i>	Meadow Pipit	Rare	Winter visitor	LC	-	Appendix II	OSBK
	<i>Anthus cervinus</i>	Red-throated Pipit	Rare	Summer visitor	LC	-	Appendix II	OSBK
	<i>Anthus spinoletta</i>	Water Pipit	Rare	Resident	LC	-	Appendix II	OSBK
	<i>Motacilla flava</i>	Yellow Wagtail	Median	Summer visitor	LC	-	Appendix II	OSBK
	<i>Motacilla cinerea</i>	Grey Wagtail	Rare	Resident	LC	-	Appendix II	OSBK
	<i>Motacilla alba</i>	White Wagtail	Common	Resident	LC	-	Appendix II	OSBK
	<i>Pycnonotus xanthopygus</i>	White-spectacled Bulbul	Rare	Resident	LC	-	Appendix III	OSBK
	<i>Cinclus cinclus</i>	White-throated Dipper	Median	Resident	LC	-	Appendix II	OSBK
Troglodytidae	<i>Troglodytes troglodytes</i>	Winter Wren	Rare	Resident	LC	-	Appendix II	OSBK
	<i>Prunella modularis</i>	Hedge Accentor	Rare	Resident	LC	-	Appendix II	OSBK
Prunellidae	<i>Prunella collaris</i>	Alpine Accentor	Rare	Resident	LC	-	Appendix II	OSBK
	<i>Turdus torquatus</i>	Ring Ouzel	Rare	Resident	LC	-	Appendix II	OSBK
Turdidae	<i>Turdus merula</i>	Eurasian Blackbird	Median	Resident	LC	-	Appendix II	Appendix I
	<i>Turdus iliacus</i>	Redwing	Rare	Resident	LC	-	Appendix III	Appendix I
	<i>Turdus philomelos</i>	Song Thrush	Rare	Winter visitor	LC	-	Appendix III	Appendix I
	<i>Turdus pilaris</i>	Fieldfare	Rare	Winter visitor	LC	-	Appendix III	Appendix I
	<i>Turdus viscivorus</i>	Mistle Thrush	Median	Resident	LC	-	Appendix III	Appendix I
	<i>Cettia cetti</i>	Cetti's Warbler	Rare	Resident	LC	-	Appendix III	OSBK
	<i>Pirinia gracilis</i>	Graceful Prinia	Rare	Resident	LC	-	Appendix II	OSBK
	<i>Locustella luscinioides</i>	Savi's Warbler	Rare	Summer visitor	LC	-	Appendix II	OSBK
	<i>Acrocephalus schoenobaenus</i>	Sedge Warbler	-	Summer visitor	LC	-	Appendix II	OSBK
	<i>Acrocephalus scirpaceus</i>	Eurasian Reed-warbler	Median	Summer visitor	LC	-	Appendix II	OSBK
Sylviidae	<i>Acrocephalus arundinaceus</i>	Great Reed-warbler	Common	Summer visitor	LC	-	Appendix II	OSBK
	<i>Hippolais olivetorum</i>	Olive-tree Warbler	Rare	Summer visitor	LC	-	Appendix II	OSBK
	<i>Hippolais icterina</i>	Icterine Warbler	Rare	Summer visitor	LC	-	Appendix II	OSBK
	<i>Hippolais pallida</i>	Eastern Olivaceous Warbler	Rare	Summer visitor	LC	-	Appendix II	OSBK
								(Contd.)

<i>Sylvia hortensis</i>	Orphean Warbler	Rare	Passage migrant	LC	-	Appendix II	OSBK
<i>Sylvia curruca</i>	Lesser Whitethroat	Median	Summer visitor	LC	-	Appendix II	OSBK
<i>Sylvia borin</i>	Garden Warbler	Rare	Passage migrant	LC	-	Appendix II	OSBK
<i>Sylvia communis</i>	Common Whitethroat	-	Summer visitor	LC	-	Appendix II	OSBK
<i>Sylvia melanocephala</i>	Sardinian Warbler	Median	Summer visitor	LC	-	Appendix II	OSBK
<i>Sylvia atricapilla</i>	Blackcap	Rare	Summer visitor	LC	-	Appendix II	OSBK
<i>Sylvia rueppelli</i>	Rueppell's Warbler	Rare	Summer visitor	LC	-	Appendix II	OSBK
<i>Phylloscopus bonelli</i>	Bonelli's Warbler	Rare	Summer visitor	LC	-	Appendix II	OSBK
<i>Phylloscopus sibilatrix</i>	Wood Warbler	Rare	Summer visitor	LC	-	Appendix II	OSBK
<i>Phylloscopus collybita</i>	Common Chiffchaff	Median	Resident	LC	-	Appendix II	OSBK
<i>Phylloscopus trochilus</i>	Willow Warbler	Rare	Passage migrant	LC	-	Appendix II	OSBK
<i>Phylloscopus orientalis</i>	Eastern Bonelli's warbler	Rare	Summer visitor	LC	-	Appendix II	OSBK
<i>Regulus regulus</i>	Goldcrest	-	Resident	LC	-	Appendix II	OSBK
<i>Regulus ignicapillus</i>	Firecrest	-	Resident	LC	-	Appendix II	OSBK
<i>Muscicapa striata</i>	Spotted Flycatcher	Median	Summer visitor	LC	-	Appendix II	OSBK
<i>Ficedula parva</i>	Red-breasted Flycatcher	Rare	Passage migrant	LC	-	Appendix II	OSBK
<i>Ficedula hypoleuca</i>	European Pied Flycatcher	Rare	Summer visitor	LC	-	Appendix II	OSBK
<i>Ficedula albicollis</i>	Collared Flycatcher	-	Summer visitor	LC	-	Appendix II	OSBK
<i>Ficedula semitorquata</i>	Semi-collared Flycatcher	-	Summer visitor	LC	-	Appendix II	OSBK
<i>Erethacus rubecula</i>	European Robin	Median	Resident	LC	-	Appendix II	OSBK
<i>Erythropgygia galactotes</i>	Rufous-tailed Scrub-robin	Rare	Passage migrant	LC	-	Appendix II	OSBK
<i>Luscinia megarhynchos</i>	Common Nightingale	Median	Summer visitor	LC	-	Appendix II	OSBK
<i>Irania gutturalis</i>	White-throated Robin	Rare	Summer visitor	LC	-	Appendix II	OSBK
<i>Phoenicurus ochruros</i>	Black Redstart	Median	Resident	LC	-	Appendix II	OSBK
<i>Phoenicurus phoenicurus</i>	Common Redstart	Median	Summer visitor	LC	-	Appendix II	OSBK
<i>Saxicola ubeira</i>	Whinchat	Median	Resident	LC	-	Appendix II	OSBK
<i>Saxicola torquatus</i>	Common Stonechat	Median	Winter visitor	LC	-	Appendix II	OSBK
<i>Oenanthe oenanthe</i>	Northern Wheatear	Median	Summer visitor	LC	-	Appendix II	OSBK
<i>Oenanthe pleschanka</i>	Pied Wheatear	Rare	Summer visitor	LC	-	Appendix II	OSBK
<i>Oenanthe hispanica</i>	Black-eared Wheatear	Median	Summer visitor	LC	-	Appendix II	OSBK
<i>Oenanthe finschii</i>	Finsch's Wheatear	Rare	Summer visitor	LC	-	Appendix II	OSBK
<i>Oenanthe isabellina</i>	Isabelline Wheatear	Rare	Summer visitor	LC	-	Appendix II	OSBK
<i>Monticola saxatilis</i>	Rufous-tailed Rock-thrush	Rare	Summer visitor	LC	-	Appendix III	OSBK
<i>Monticola solitarius</i>	Blue Rock-thrush	Rare	Summer visitor	LC	-	Appendix II	OSBK
<i>Panurus biarmicus</i>	Bearded Parrotbill	Rare	Resident	LC	-	Appendix II	OSBK
<i>Aegithalos caudatus</i>	Long-tailed Tit	Rare	Resident	LC	-	Appendix II	OSBK
<i>Parus ater</i>	Coal Tit	Median	Resident	LC	-	Appendix III	Appendix I
<i>Parus caeruleus</i>	Blue Tit	Median	Resident	LC	-	Appendix II	OSBK
<i>Parus major</i>	Great Tit	Median	Resident	LC	-	Appendix II	OSBK
<i>Parus ugburis</i>	Sombre Tit	Rare	Resident	LC	-	Appendix II	OSBK
<i>Sitta europaea</i>	Wood Nuthatch	Median	Resident	LC	-	Appendix II	OSBK
<i>Sitta neumayer</i>	Western Rock-nuthatch	Median	Resident	LC	-	Appendix II	OSBK
<i>Sitta krueperi</i>	Krueper's Nuthatch	Median	Resident	LC	-	Appendix II	OSBK
<i>Tichodroma muraria</i>	Wallcreeper	-	Resident	LC	-	Appendix III	Appendix I
<i>Certhia brachydactyla</i>	Short-toed Treecreeper	Rare	Resident	LC	-	Appendix II	OSBK

(Contd.)



<i>Certhia familiaris</i>	Eurasian Treecreeper	-	Resident	LC	-	Appendix II	OSBK
<i>Remiz pendulinus</i>	Eurasian Penduline-tit	-	Resident	LC	-	Appendix III	Appendix I
<i>Oriolus oriolus</i>	Eurasian Golden Oriole	Rare	Summer visitor	LC	-	Appendix II	OSBK
<i>Lanius collurio</i>	Red-backed Shrike	Median	Summer visitor	LC	-	Appendix II	OSBK
<i>Lanius minor</i>	Lesser Grey Shrike	Rare	Summer visitor	LC	-	Appendix II	OSBK
<i>Lanius excubitor</i>	Great Grey Shrike	Rare	Winter visitor	LC	-	Appendix II	OSBK
<i>Lanius senator</i>	Woodchat Shrike	Median	Resident	LC	-	Appendix II	OSBK
<i>Lanius nubicus</i>	Masked Shrike	Rare	Summer visitor	LC	-	Appendix II	OSBK
<i>Garrulus glandarius</i>	Eurasian Jay	Median	Resident	LC	-	Appendix III	Appendix II
<i>Pica pica</i>	Black-billed Magpie	Common	Resident	LC	-	Appendix III	Appendix II
<i>Pyrrhoxorax graculus</i>	Yellow-billed Cough	Rare	Resident	LC	-	Appendix II	OSBK
<i>Pyrrhoxorax pyrrhoxorax</i>	Red-billed Cough	Median	Resident	LC	-	Appendix II	OSBK
<i>Corvus monedula</i>	Eurasian Jackdaw	Median	Resident	LC	-	Appendix II	Appendix II
<i>Corvus frugilegus</i>	Rook	Common	Resident	LC	-	Appendix III	Appendix I
<i>Corvus corax</i>	Common Raven	Median	Resident	LC	-	Appendix II	Appendix II
<i>Corvus cornix</i>	Hooded crow	Common	Resident	LC	-	Appendix III	Appendix II
<i>Sturnus vulgaris</i>	Common Starling	Common	Resident	LC	-	Appendix III	Appendix I
<i>Sturnus roseus</i>	Rosy Starling	Common	Summer visitor	LC	-	Appendix II	OSBK
<i>Passer domesticus</i>	House Sparrow	Common	Resident	LC	-	Appendix III	Appendix II
<i>Passer montanus</i>	Eurasian Tree Sparrow	Common	Resident	LC	-	Appendix III	Appendix I
<i>Passer hispaniolensis</i>	Spanish Sparrow	Median	Resident	LC	-	Appendix III	Appendix I
<i>Montifringilla nivalis</i>	White-winged Snowfinch	Common	Resident	LC	-	Appendix II	OSBK
<i>Petronia petronia</i>	Rock Sparrow	Rare	Resident	LC	-	Appendix II	OSBK
<i>Fringilla coelebs</i>	Eurasian Chaffinch	Rare	Resident	LC	-	Appendix III	Appendix I
<i>Fringilla montifringilla</i>	Brambling	Common	Winter visitor	LC	-	Appendix III	Appendix I
<i>Serinus serinus</i>	European Serin	Rare	Resident	LC	-	Appendix II	OSBK
<i>Serinus pusillus</i>	Fire-fronted Serin	Common	Resident	LC	-	Appendix II	OSBK
<i>Carduelis chloris</i>	European Greenfinch	Common	Resident	LC	-	Appendix II	OSBK
<i>Carduelis carduelis</i>	European Goldfinch	Median	Resident	LC	-	Appendix II	OSBK
<i>Carduelis spinus</i>	Eurasian Siskin	Common	Winter visitor	LC	-	Appendix II	OSBK
<i>Carduelis cannabina</i>	Eurasian Linnet	Common	Resident	LC	-	Appendix II	OSBK
<i>Carduelis flavirostris</i>	Twite	Common	Resident	LC	-	Appendix II	OSBK
<i>Loxia curvirostra</i>	Red Crossbill	Rare	Resident	LC	-	Appendix II	OSBK
<i>Coccothraustes coccothraustes</i>	Hawfinch	Rare	Winter visitor	LC	-	Appendix II	OSBK
<i>Pyrrhula pyrrhula</i>	Eurasian Bullfinch	Rare	Resident	LC	-	Appendix III	Appendix I
<i>Rhodopechys sanguineus</i>	Asian Crimson-winged Finch	Rare	Resident	LC	-	Appendix III	Appendix I
<i>Emberiza citrinella</i>	Yellowhammer	Rare	Winter visitor	LC	-	Appendix II	OSBK
<i>Emberiza acia</i>	Rock Bunting	Rare	Resident	LC	-	Appendix II	OSBK
<i>Emberiza hortulana</i>	Otolan Bunting	Median	Summer visitor	LC	-	Appendix III	Appendix I
<i>Emberiza citrillus</i>	Cirl Bunting	Common	Winter visitor	LC	-	Appendix II	OSBK
<i>Emberiza caesia</i>	Cretschmar's Bunting	Median	Summer visitor	LC	-	Appendix II	OSBK
<i>Emberiza schoeniclus</i>	Reed Bunting	Rare	Winter visitor	LC	-	Appendix II	OSBK
<i>Emberiza bruniceps</i>	Red-headed Bunting	Rare	Summer visitor	LC	-	Appendix III	Appendix I
<i>Emberiza melanocephala</i>	Black-headed Bunting	Median	Summer visitor	LC	-	Appendix II	OSBK
<i>Emberiza calandra</i>	Corn Bunting	Common	Resident	LC	-	Appendix III	Appendix I

MAK: Central Hunting Commission (Turkey); OSBK: Wild animals taken under protection by Ministry of Forestry and Water Affairs

threat and later ecosystem changes, agricultural practices and human activities can be resolved with relevant conservation.

### Acknowledgments

The author thanks T.C. Ministry of Forestry and Water Affairs, VI.District Directorate of Nature Conservation and National Parks, Ekoiz Environmental and Social Planning Research Training and Consulting Trade. Ltd. Sti. I am indebted to PhD student Biologist İbrahim TAVUÇ.

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