



# Bird Species of Erzurum Marshes in Northeastern Anatolia, Turkey

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## ABSTRACT

Bird species of Erzurum Marshes, which were known to be the “Bird Paradise” in the region until recently experiencing a rapid decline. Risks threatening bird species in the region were examined. Erzurum Marshes, located in the northeastern part of the country, host almost half of the bird species of Turkey of which many bird species are under threat both at national and international level. In all 239 bird species were identified. Among these species, 10 species were found to be under threat of extinction at national and international (IUCN) scale. Deterioration of habitats of birds as well as other forms of life has been considered to be the most important factor. Even though the importance of wetland ecosystems is well known, no remarkable effort for saving the Erzurum Marshes, was observed.

## Article Information

Received 21 August 2017

Revised 02 October 2017

Accepted 01 November 2017

Available online 13 March 2018

## Authors' Contribution

This article is a part of master thesis of AS, AA, AS and SB participated in field surveys. AS wrote the manuscript. AS, AA and SB identified the species.

## Key words

Wetland, Marsh, Bird Species, Erzurum, Turkey.

## INTRODUCTION

Interest in the conduct of studies on birds in Turkey has considerably increased in recent years, however not to the desired levels. So far 504 bird species have been reported from Turkey (Kızıroğlu, 2009). The number of basins in eastern Turkey, considered to be important for birds, is gradually increasing day by day, however this research is limited and insufficient. Erzurum Marshes, are located near Erzurum (Coordinates = Latitude: 39.9902° N, Longitude: 41.3399° E) in eastern Turkey (Sari, 2010). The marshy place in Erzurum plain has a minimum of 1500 years of documented background history. Besides the marshy parts of the land, meadows also exist in the region. Until recently, the local people benefited from birds and their eggs (Tozlu, 2002). Erzurum Marshes were declared to be Important Bird Area in 1997 (Yarar and Magnin, 1997) and Important Natural Area in 2006 (Eken *et al.*, 2006). No scientific study of the desired quality is however available.

In Turkey, a significant increase has been observed in the number of studies carried out on birds since 1990s. Some of those carried out near the Erzurum Marshes (in eastern Black Sea, Eastern Anatolia, and Southeastern Anatolia regions) are: Curzon (1854) was the first to study birds in Erzurum Marshes when he identified 172 bird species in the region. Recent studies include:

Ayvaz (1990) studied the “birds of Pınarbaşı Lake-Malatya”, Ayvaz (1991) “bird species of Çıldır Lake-Ardahan”, and Ayvaz (1993) “Ornithological Observations around Elazığ Province”. Adizel (1993) and Kızıroğlu (1994), reported population intensity of 112 bird species and their population intensity. Başkaya (1994) carried out a study on migratory bird species of Eastern Black Sea region. Adizel (1998) studied bird fauna of Van Lake basin, and reported on the biology and population intensities of 147 bird species. Durmuş (2002) studied the biology and population intensities of 83 bird species of Balık Lake (Doğubeyazıt–Ağrı) and its surroundings. Sari (2010) studied the bird species of Erzurum Marshes.

The study area is on the migration route (Black Sea and Mediterranean flyway) that is used, on their annual spring and autumn migration, by about one million large falconiforms including vultures, eagles, hawks, falcons, sparrow hawks, and kestrel species of western Palearctic (Başkaya, 1994).

## MATERIALS AND METHODS

### Study area

Erzurum Marshes are located within the borders of Erzurum-Kars part of Eastern Anatolian region. Kargapazarı Mounts on eastern side of the marsh, Dumlu Mounts, the extension of Allahuekber Mounts, in the north, Erzurum province and Palandöken Mounts in the south, and İlica district in the west (Sari, 2010).

On majority of lands of Erzurum province, the

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0030-9923/2018/0002-0629 \$ 9.00/0

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dominant climate is continental. Winters are long and harsh, and summers short and hot. Annual mean temperature is 5.1°C. Considering the course of temperature in the year, the coolest month is January (-10.6°C), while the hottest month is August (19.6°C). Annual mean precipitation in Erzurum is 32.9 mm.

Central parts of Erzurum Plain are very flat. This section, due to the high level of groundwater, is dominated by marshes and marshy lands (Eroğlu, 1998).

Erzurum Marshes embrace Soğucak, Çayırtepe, Kösemehmet, Güzelova, Yolgeçti, Müllkköy, Çayırca and Beypınarı villages and Erzurum Airport. Erzurum marshes were selected because of being located on the bird migration route, an appropriate habitat in existence since 1500 years that is threatened with extinction; and non-availability of authentic scientific data.

#### Methodology

Birds were observed whole the year round from April 2008 to December 2016 during all the seasons *i.e.* spring (March-April-May), summer (June-July-August), autumn (September-October-November), and winter (December-January-February). In total 240 observations were made. Observations during spring and autumn more frequent because of bird migration. Swarovski 10x42 LC binocular and ATS/STS 80 (HD) (20-60x) telescope were used to observe birds. Various digital cameras (3x optical zoom-5.0 Mega Pixels and 12x optical zoom-6.0 Mega Pixels) and video recorder (24x optical zoom) were used to take photographs of bird species, their habitats and to record observations. Global Positioning System (Magellan Explorist 500L GPS) was employed to record the altitude and coordinates in the field. While observing the birds, location, date, and hour of observation, the species identified, nesting status of species, and the actual climatic conditions were recorded. Depending on the season, observations started with the sunrise (05:00-06:30) and continued until the sunset (17:00-20:30). To identify bird species Heinzl *et al.* (1995), Jonsson (2006) and Kızıroğlu (2009) were used. For bird species that could not be identified in the field, ancillary information such as photographs, time of occurrence in the field etc. was recorded in detail, and the species were subsequently identified.

We also conducted interviews with Provincial Directorate for Nature Conservation and National Parks, Directorate for Surveying and Projects in State Hydraulic Works, teachers, villagers, and shepherds: field situation in the past, poaching, and whether the species of special interest to the local people was discussed.

## RESULTS AND DISCUSSION

In total 239 bird species belonging to 54 families and 19 orders were observed on and nearby the Erzurum marshes (Table I).

Ten species are considered to be threatened viz., Endangered (EN): *Falco cherrug* and *Neophron percnopterus*, Near Threatened (NT): *Aegypius monachus*, *Aythya nyroca*, *Falco vespertinus*, *Limosa limosa* and *Numenius arquata*, and Vulnerable (VU): *Aquila clanga*, *Aquila heliaca* and *Otis tarda*; and the balance 229 species as Least Concern (LC) (IUCN Red List of Threatened Species, 2017-2).

*Alcedo atthis*, *Calidris ferruginea*, *Charadrius asiaticus*, *Charadrius morinellus*, *Cygnus olor*, *Gallinago media*, *Jynx torquilla*, *Larus audouinii*, *Milvus milvus*, *Otus brucei*, *Pelacanus onocrotalus*, *Phalacrocorax carbo*, *Podiceps auritus*, *Tetrax tetrax*, *Tringa nebularia* and *Vanellus leucura* reported by Curzon (1854) could not be observed during the present study.

Sixty three new species (not reported by Curzon (1854)) were observed during the present study including: *Acrocephalus arundinaceus*, *Acrocephalus melanopogon*, *Acrocephalus palustris*, *Acrocephalus scirpaceus*, *Acrocephalus schoenobaenus*, *Anser fabalis*, *Anthus spinoletta*, *Aquila clanga*, *Aquila pomarina*, *Aythya fuligula*, *Bubo bubo*, *Burhinus oedipnemos*, *Buteo lagopus*, *Calidris minuta*, *Carpodacus erythrinus*, *Cercotichas galactotes*, *Cettia cetti*, *Charadrius alexandrinus*, *Charadrius leschenaultii*, *Chlidonias niger*, *Coccothraustes coccothraustes*, *Columba palumbus*, *Corvus corone pallescens*, *Dendrocopos medius*, *Falco biarmicus*, *Falco naumanni*, *Ficedula semitorquata*, *Haematopus ostralegus*, *Haliaeetus albicilla*, *Hieraaetus fasciatus*, *Ixobrychus minutus*, *Larus armenicus*, *Larus cachinnans*, *Locustella luscinioides*, *Luscinia svecica*, *Lymnocyptes minimus*, *Melanocorypha bimaculata*, *Melanocorypha calandra*, *Monticola saxatilis*, *Monticola solitarius*, *Motacilla citreola*, *Muscicapa striata*, *Netta rufina*, *Numenius arquata*, *Parus lugubris*, *Pernis apivorus*, *Phylloscopus collybita*, *Porzana parva*, *Porzana porzana*, *Porzana pusilla*, *Philomachus pugnax*, *Prunella collaris*, *Prunella modularis*, *Pyrrhula pyrrhula*, *Recurvirostra avosetta*, *Sterna albifrons*, *Streptopelia senegalensis*, *Serinus pusillus*, *Sylvia atricapilla*, *Sylvia hortensis*, *Tachybaptus ruficollis*, *Tichodroma muraria*, *Trochiloides nitidus*, *Tyto alba*, and *Vanellus spinosus*.

The bird species, identified for the first time in the study area by Curzon (1854), have also been reported by Kumerloeve (1969), (1984), Ayvaz (1990), (1991), (1993), Adizel (1993), (1998), Başkaya (1994), Akyıldız (2002) and Durmuş (2002): *Acrocephalus melanopogon*,

*Acrocephalus schoenobaenus*, *Anser fabalis*, *Aquila clanga*, *Cercotichas galactotes*, *Charadrius leschenaultii*, *Corvus corone pallescens*, *Dendrocopos medius*, *Falco biarmicus*, *Ficedula semitorquata*, *Hieraetus fasciatus*, *Larus armenicus*, *Larus cachinnans*, *Monticola solitarius*, *Porzana parva*, *Porzana pusilla*, *Prunella collaris*, *Prunella modularis*, *Serinus pusillus*, *Streptopelia*

*senegalensis*, *Sylvia hortensis*, *Tichodroma muraria*, *Trochiloides nitidus* and *Vanellus spinosus*.

*Falco vespertinus*, *Pernis apivorus*, *Pyrrhula pyrrhula* observed during the present study have also been reported by Bařkaya (1994), *Sterna albifrons* only by Ayvaz (1991), *Aythya nyroca* by Adizel (1998) and Ayvaz (1993), and *Numenius arquata* by Ayvaz (1993).

**Table I.- Bird species observed and migratory status (MS) on and around Erzurum Marshes from April 2008 to December 2016 (Status: W, wintering; S, summer visitor; PM, passage migrant; R, resident ).**

Order	Family	Euro code	Scientific name	English name	Status
Podicipediformes	Podicipedidae	70	<i>Tachybaptus ruficollis</i>	Little grebe	W
		90	<i>Podiceps cristatus</i>	Great crested grebe	W
		100	<i>Podiceps grisegana</i>	Red-necked grebe	W
		120	<i>Podiceps nigricollis</i>	Black-necked grebe	W
Pelecaniformes	Ardeidae	950	<i>Botaurus stellaris</i>	Bittern	W
		970	<i>Ixobrychus minutus</i>	Little bittern	W
		1010	<i>Nycticorax nycticorax</i>	Night heron	W
		1080	<i>Ardeola ralloides</i>	Squacco heron	W
		1110	<i>Bubulcus ibis</i>	Cattle egret	W
		1190	<i>Egretta garzetta</i>	Little egret	W, R
		1210	<i>Egretta alba</i>	Great white egret	W, R
		1220	<i>Ardea cinerea</i>	Grey heron	W, R
		1240	<i>Ardea purpurea</i>	Purple heron	W, R
		Ciconiiformes	Ciconiidae	1310	<i>Ciconia nigra</i>
1340	<i>Ciconia ciconia</i>			White stork	W, R
Pelecaniformes	Threskiornithidae	1360	<i>Plegadis falcinellus</i>	Glossy ibis	W, R
		1440	<i>Platella leucorodia</i>	Spoonbill	S
Anseriformes	Anatidae	1570	<i>Anser fabalis</i>	Bean goose	W
		1590	<i>Anser albifrons</i>	White-fronted goose	W
		1610	<i>Anser anser</i>	Graylag goose	W
		1710	<i>Tadorna ferruginea</i>	Ruddy shelduck	S
		1730	<i>Tadorna tadorna</i>	Shelduck	S
		1790	<i>Anas penelope</i>	Wigeon	S
		1820	<i>Anas strepera</i>	Gadwall	S
		1840	<i>Anas crecca</i>	Teal	W, R
		1860	<i>Anas platyrhynchos</i>	Mallard	W, R
		1890	<i>Anas acuta</i>	Pintail	W
		1910	<i>Anas querquedula</i>	Garganey	W, R
		1940	<i>Anas clypeata</i>	Shoveler	W, R
		1960	<i>Netta rufina</i>	Red-crested pochard	W, R
		1980	<i>Aythya ferina</i>	Pochard	W, R
		2020	<i>Aythya nyroca</i>	Ferruginous duck	W, R
		2030	<i>Aythya fuligula</i>	Tufted duck	W, R
Accipitriformes	Accipitridae	2310	<i>Pernis apivorus</i>	Honey buzzard	PM
		2380	<i>Milvus migrans</i>	Black kite	R
		2430	<i>Haliaeetus albicilla</i>	White-tailed eagle	R
		2460	<i>Gypaetus barbatus</i>	Lammergeier	R
		2470	<i>Neophron percnopterus</i>	Egyptian vulture	R
		2510	<i>Gyps fulvus</i>	Griffon vulture	S
		2550	<i>Aegypius monachus</i>	Black vulture	S

Order	Family	Euro code	Scientific name	English name	Status		
Accipitriformes	Accipitridae	2560	<i>Circaetus gallicus</i>	Short-toed eagle	PM		
		2600	<i>Circus aeruginosus</i>	Marsh harrier	R, PM		
		2610	<i>Circus cyaneus</i>	Northern harrier	R, PM		
		2630	<i>Circus pygargus</i>	Montagu's harrier	R		
		2670	<i>Accipiter gentilis</i>	Northern goshawk	R, PM		
		2690	<i>Accipiter nisus</i>	Sparrowhawk	R		
		2870	<i>Buteo buteo</i>	Buzzard	R		
		2880	<i>Buteo rufinus</i>	Long-legged buzzard	R		
		2900	<i>Buteo lagopus</i>	Rough-legged buzzard	R		
		2920	<i>Aquila pomarina</i>	Lesser spotted eagle	R, PM		
		2930	<i>Aquila clanga</i>	Spotted eagle	PM		
		2945	<i>Aquila nipalensis</i>	Steppe eagle	PM		
		2950	<i>Aquila heliaca</i>	Imperial eagle	PM		
		2960	<i>Aquila chrysaetos</i>	Golden eagle	PM		
		2980	<i>Hieraetus pennatus</i>	Booted eagle	PM		
		2990	<i>Hieraetus fasciatus</i>	Bonelli's eagle	PM		
		Falconiformes	Pandionidae	3010	<i>Pandion haliaetus</i>	Osprey	PM
			Falconidae	3030	<i>Falco naumanni</i>	Lesser kestrel	R
				3040	<i>Falco tinnunculus</i>	Kestrel	R
3070	<i>Falco vespertinus</i>			Red-footed falcon	PM		
3090	<i>Falco columbarius</i>			Merlin	W, PM		
3100	<i>Falco subbuteo</i>			Hobby	PM		
3140	<i>Falco biarmicus</i>			Lanner	S, PM		
3160	<i>Falco cherrug</i>			Saker	S, PM		
3200	<i>Falco peregrinus</i>			Peregrine	S, PM		
Galliformes	Phasianidae			3550	<i>Alectoris chukar</i>	Chukar	R
		3670	<i>Perdix perdix</i>	Grey partridge	R		
		3700	<i>Coturnix coturnix</i>	Quail	W		
Gruiformes	Rallidae	4070	<i>Rallus aquaticus</i>	Water rail	W		
		4080	<i>Porzana porzana</i>	Spotted crane	PM		
		4100	<i>Porzana parva</i>	Little crane	PM		
		4110	<i>Porzana pusilla</i>	Baillon's crane	PM		
		4210	<i>Crex crex</i>	Corncrake	PM		
		4240	<i>Gallinula chloropus</i>	Moorhen	PM		
		4290	<i>Fulica atra</i>	Common coot	PM		
		4330	<i>Grus grus</i>	Crane	R, PM		
		4410	<i>Grus virgo</i>	Demoiselle crane	PM		
		4460	<i>Otis tarda</i>	Great bustard	R, S		
Charadriiformes	Haematopodidae	4500	<i>Haematopus ostralegus</i>	Oystercatcher	S		
	Recurvirostridae	4550	<i>Himantopus himantopus</i>	Black-winged stilt	S		
		4560	<i>Recurvirostra avosetta</i>	Avocet	S, R		
		4590	<i>Burhinus oediconemus</i>	Stone-curlew	S		
	Burhinidae	4590	<i>Burhinus oediconemus</i>	Stone-curlew	S		
	Glareolidae	4650	<i>Glareola pratincola</i>	Collared pratincole	PM		
		Charadriidae	4690	<i>Charadrius dubius</i>	Little ringed plover	R, PM	
	4770		<i>Charadrius alexandrinus</i>	Kentish plover	PM		
	4790		<i>Charadrius leschenaultii</i>	Greater sand plover	S		
	4870		<i>Vanellus spinosus</i>	Spur-winged plover	S, PM		
	4930		<i>Vanellus vanellus</i>	Lapwing	S, PM		
	Scolopacidae		5010	<i>Calidris minuta</i>	Little stint	S	
			5170	<i>Calidris pugnax</i>	Ruff	S	
			5180	<i>Lymnocyptes minimus</i>	Jack snipe	W, PM	

Order	Family	Euro code	Scientific name	English name	Status
	Scolopacidae	5190	<i>Gallinago gallinago</i>	Snipe	W,PM
		5290	<i>Scolopax rusticola</i>	Woodcock	PM
		5320	<i>Limosa limosa</i>	Black-tailed godwit	S
		5410	<i>Numenius arquata</i>	Curlew	PM
		5450	<i>Tringa erythropus</i>	Spotted redshank	PM
		5460	<i>Tringa totanus</i>	Redshank	S, PM
		5530	<i>Tringa ochropus</i>	Green sandpiper	S, PM
		5560	<i>Actitis hypoleucos</i>	Common sandpiper	S
	Laridae	5820	<i>Larus ridibundus</i>	Black-headed gull	S, PM
		5850	<i>Larus genei</i>	Slender-billed gull	S, PM
		5921	<i>Larus armenicus</i>	Armenian gull	R
		5925	<i>Larus cachinnans</i>	Yellow-legged gull	R
		6150	<i>Sterna hirundo</i>	Common tern	S
		6240	<i>Sterna albifrons</i>	Little tern	S
		6270	<i>Chlidonias niger</i>	Black tern	S
		6280	<i>Chlidonias leucopterus</i>	White-winged black tern	S
Pterocliiformes	Pteroclididae	6610	<i>Pterocles orientalis</i>	Black-bellied sandgrouse	PM
Columbiformes	Columbidae	6650	<i>Columba livia</i>	Rock dove	R
		6680	<i>Columba oenas</i>	Stock dove	R
		6700	<i>Columba palumbus</i>	Woodpigeon	S
		6840	<i>Streptopelia decaocto</i>	Collared dove	R
		6870	<i>Streptopelia turtur</i>	Turtle dove	S
		6900	<i>Streptopelia senegalensis</i>	Laughing dove	R
Cuculiformes	Cuculidae	7240	<i>Cuculus canorus</i>	Cuckoo	S
Strigiformes	Tytonidae	7350	<i>Tyto alba</i>	Barn owl	R
	Strigidae	7390	<i>Otus scops</i>	Scops owl	S
		7440	<i>Bubo bubo</i>	Eurasian eagle owl	R
		7570	<i>Athene noctua</i>	Little owl	R
		7610	<i>Strix aluco</i>	Tawny owl	R
		7670	<i>Asio otus</i>	Long-eared owl	R
Caprimulgiformes	Caprimulgidae	7780	<i>Caprimulgus europaeus</i>	European nightjar	S
	Apodidae	7950	<i>Apus apus</i>	Common swift	S
		7980	<i>Apus melba</i>	Alpine swift	S
Coraciiformes	Meropidae	8400	<i>Merops apiaster</i>	Bee-eater	S, PM
	Coraciidae	8410	<i>Coracias garrulus</i>	European roller	S
Bucerotiformes	Upupidae	8460	<i>Upupa epops</i>	Hoopoe	S
Piciformes	Picidae	8550	<i>Picus viridis</i>	Green woodpecker	R
		8760	<i>Dendrocopos major</i>	Great spotted woodpecker	R
		8780	<i>Dendrocopos syriacus</i>	Syrian woodpecker	R
		8830	<i>Dendrocopos medius</i>	Middle spotted woodpecker	R
		8870	<i>Dendrocopos minor</i>	Lesser spotted woodpecker	R
Passeriformes	Alaudidae	9610	<i>Melanocorypha calandra</i>	Calandra lark	R
		9620	<i>Melanocorypha bimaculata</i>	Bimaculated lark	S
		9670	<i>Calandrella brachydactyla</i>	Short-toed lark	S, PM
		9700	<i>Alauda rufescens</i>	Lesser short-toed lark	S
		9720	<i>Galerida cristata</i>	Crested lark	R
		9740	<i>Lullula arborea</i>	Woodlark	S
		9760	<i>Alauda arvensis</i>	Skylark	S
		9780	<i>Eremophila alpestris</i>	Shore lark	R
	Hirundinidae	9810	<i>Riparia riparia</i>	Sand martin	S

Order	Family	Euro code	Scientific name	English name	Status	
Passeriformes	Hirundinidae	9910	<i>Hirundo rupestris</i>	Crag martin	S, PM	
		9920	<i>Hirundo rustica</i>	Swallow	S, PM	
		10010	<i>Delichon urbicum</i>	House martin	S, PM	
	Motacillidae	10040	<i>Anthus campestris</i>	Tawny pipit	S	
		10090	<i>Anthus trivialis</i>	Tree pipit	S	
		10110	<i>Anthus pratensis</i>	Meadow pipit	S	
		10140	<i>Anthus spinoletta</i>	Water pipit	S	
		10170	<i>Motacilla flava</i>	Yellow wagtail	S	
		10180	<i>Motacilla citreola</i>	Citrine wagtail	S	
		10190	<i>Motacilla cinerea</i>	Grey wagtail	S, PM	
		10200	<i>Motacilla alba</i>	Pied wagtail	R, PM	
		Cinclidae	10500	<i>Cinclus cinclus</i>	Dipper	R
		Troglodytidae	10660	<i>Troglodytes troglodytes</i>	Wren	R
	Prunellidae	10840	<i>Prunella modularis</i>	Dunnock	R	
		10880	<i>Prunella ocularis</i>	Radde's accentor	PM	
		10940	<i>Prunella collaris</i>	Alpine accentor	R	
	Muscicapidae	10950	<i>Cercotrichas galactotes</i>	Rufous bush robin	S	
		10990	<i>Erithacus rubecula</i>	Robin	R	
		11040	<i>Luscinia megarhynchos</i>	Nightingale	S	
		11060	<i>Luscinia svecica</i>	Bluethroat	PM	
		11210	<i>Phoenicurus ochruros</i>	Black redstart	S	
		11220	<i>Phoenicurus phoenicurus</i>	Redstart	S	
		11370	<i>Saxicola rubetra</i>	Whinchat	S	
		11390	<i>Saxicola torquata</i>	Stonechat	S	
		11440	<i>Oenanthe isabellina</i>	Isabellina wheatear	S	
		11460	<i>Oenanthe oenanthe</i>	Northern wheatear	S	
		11480	<i>Oenanthe hispanica</i>	Black-eared wheatear	S	
		11610	<i>Monticola saxatilis</i>	Rock thrush	S	
		11660	<i>Monticola solitarius</i>	Blue rock thrush	S	
		Turdidae	11860	<i>Turdus torquatus</i>	Ring ouzel	S
	11870		<i>Turdus merula</i>	Blackbird	R	
	11980		<i>Turdus pilaris</i>	Fieldfare	W	
	12000		<i>Turdus philomelos</i>	Song thrush	S, PM	
	12020		<i>Turdus viscivorus</i>	Mistle thrush	R, PM	
	Scotocercidae		12200	<i>Cettia cetti</i>	Cetti's warbler	R
	Locustellidae		12380	<i>Locustella luscinioides</i>	Savi's warbler	S
	Acrocephalidae	12410	<i>Acrocephalus melanopogon</i>	Moustached warbler	S	
		12430	<i>Acrocephalus schoenobaenus</i>	Sedge warbler	S	
		12500	<i>Acrocephalus palustris</i>	Marsh warbler	S	
		12510	<i>Acrocephalus scirpaceus</i>	Reed warbler	S	
		12530	<i>Acrocephalus arundinaceus</i>	Great reed warbler	S	
		12550	<i>Iduna pallida</i>	Olivaceous warbler	S	
		Sylviidae	12720	<i>Sylvia hortensis</i>	Orphean warbler	S
			12740	<i>Sylvia curruca</i>	Lesser whitethroat	S
			12750	<i>Sylvia communis</i>	Whitethroat	S
			12770	<i>Sylvia atricapilla</i>	Blackcap	S
	Phylloscopidae	12910	<i>Phylloscopus nitidus</i>	Green warbler	S	
13110		<i>Phylloscopus collybita</i>	Chiffchaff	S		
Regulidae	13140	<i>Regulus regulus</i>	Goldcrest	W		
Muscicapidae	13350	<i>Muscicapa striata</i>	Spotted flycatcher	S		

Order	Family	Euro code	Scientific name	English name	Status	
Passeriformes	Muscicapidae	13430	<i>Ficedula parva</i>	Red-breasted flycatcher	PM	
		13470	<i>Ficedula semitorquata</i>	Semi-collared flycatcher	S	
	Aegithalidae	14370	<i>Aegithalos caudatus</i>	Long-tailed tit	R, W	
		Paridae	14410	<i>Poecile lugubris</i>	Sombre tit	R
	14610		<i>Parus ater</i>	Coal tit	R, W	
	14620		<i>Parus caeruleus</i>	Blue tit	R	
	14640		<i>Parus major</i>	Great tit	R	
	Sittidae		14810	<i>Sitta neumayer</i>	Rock nuthatch	R
		14820	<i>Tichodroma muraria</i>	Wallcreeper	R, PM	
	Remizidae	14900	<i>Remiz pendulinus</i>	Penduline tit	S	
	Oriolidae	15080	<i>Oriolus oriolus</i>	Golden oriole	S	
	Laniidae	15150	<i>Lanius collurio</i>	Red-backed shrike	S	
		15190	<i>Lanius minor</i>	Lesser grey shrike	S	
		15200	<i>Lanius excubitor</i>	Great grey shrike	PM	
		Corvidae	15390	<i>Garrulus glandarius</i>	Jay	R
	15490		<i>Pica pica</i>	Magpie	R	
	15580		<i>Pyrrhocorax graculus</i>	Alpine chough	PM	
	15590		<i>Pyrrhocorax pyrrhocorax</i>	Chough	PM	
	15600		<i>Corvus monedula</i>	Jackdaw	R	
	15630		<i>Corvus frugilegus</i>	Rook	R, S	
	15670		<i>Corvus corone corone</i>	Carrion crow	R	
	15680		<i>Corvus corone cornix</i>	Hooded	R	
	15720		<i>Corvus corax</i>	Raven	R	
	Sturnidae		15820	<i>Sturnus vulgaris</i>	Starling	R
			15840	<i>Sturnus roseus</i>	Rose-coloured starling	S, PM
	Passeridae		15910	<i>Passer domesticus</i>	House sparrow	R
			15980	<i>Passer montanus</i>	Tree sparrow	PM
		16040	<i>Petronia petronia</i>	Rock sparrow	R	
		16110	<i>Montifringilla nivalis</i>	Snow finch	R, W	
		Fringillidae	16360	<i>Fringilla coelebs</i>	Chaffinch	R, W
			16380	<i>Fringilla montifringilla</i>	Brambling	W
			16390	<i>Serinus pusillus</i>	Red-fronted serin	R
	16400		<i>Serinus serinus</i>	Serin	R	
	16490		<i>Carduelis chloris</i>	Greenfinch	R	
	16530		<i>Carduelis carduelis</i>	Goldfinch	R, S	
	16540	<i>Spinus spinus</i>	Siskin	R, W		
	16600	<i>Linaria cannabina</i>	Linnet	PM		
	16620	<i>Carduelis flavirostris</i>	Twite	R, PM		
	Fringillidae	16660	<i>Loxia curvirostra</i>	Crossbill	R	
		16790	<i>Carpodacus erythrinus</i>	Scarlet rosefinch	S	
		17100	<i>Pyrrhula pyrrhula</i>	Bullfinch	PM	
		17170	<i>Coccothraustes coccothraustes</i>	Hawfinch	W	
Emberizidae		18570	<i>Emberiza citrinella</i>	Yellowhammer	PM	
		18600	<i>Emberiza cia</i>	Rock bunting	R	
		18660	<i>Emberiza hortulana</i>	Ortolan bunting	S	
		18750	<i>Emberiza aureola</i>	Yellow breasted bunting	S	
		18810	<i>Emberiza melanocephala</i>	Black-headed bunting	S	
18820		<i>Miliaria calandra</i>	Corn bunting	R, S		

Kızıroğlu (1989) considered *Acrocephalus schoenobaenus*, *Alauda arvensis*, *Ardea cinerea*, *Botaurus stellaris*, *Circus aeruginosus*, *Columba palumbus*, *Fulica atra*, *Gallinula chloropus*, *Haliaeetus albicilla*, *Lullula arborea*, *Motacilla cinerea*, *Otis tarda*, *Otus scops*, *Oenanthe oenanthe*, *Phoenicurus phoenicurus*, *Podiceps cristatus*, *Podiceps nigricollis*, *Rallus aquaticus*, *Saxicola rubetra*, *Saxicola torquata*, *Tachybaptus ruficollis*, *Turdus philomelos* and *Vanellus vanellus* to be local resident species were identified to be summer migrants, while *Aegithalos caudatus*, *Anser anser*, *Coccythraustes coccythraustes* and *Regulus regulus* reported to be local residents were found to be winter migrants during the present study.

*Scolopax rusticola* reported as local resident is Passage migrant: *Anas clypeata*, *Anas penelope*, *Aythya ferina*, *Aythya fuligula*, *Hippolais pallida*, *Larus ridibundus* and *Tadorna ferruginea* that were reported to be winter migrants were found to be summer migrants whereas *Columba oenas* and *Montifringilla nivalis* reported to be summer migrant, were determined to be local residents.

*Alauda arvensis*, *Calandrella rufescens*, *Haliaeetus albicilla*, *Ptyonoprogne rupestris* and *Turdus philomelos* species reported to be local residents by Jonsson (2006) were found to be summer migrants, while *Buteo buteo*, reported to be summer migrant, was found to be local resident. *Anthus pratensis*, *Larus ridibundus*, *Pernis apivorus*, *Podiceps cristatus* and *Tringa ochropus* reported to be winter visitors, were identified to be summer migrants. Some Cattle species prefer sites for nest building, which have regular accessibility of water, and usual human activities are common nearby (Abdullah *et al.*, 2017). Erzurum marshes, located nearby city center, has regular accessibility of water for birds and has a lot of suitable nest sites for species especially cattle species too.

Being rich in bird diversity Erzurum Marshes have a significant touristic potential. Besides other large falconiforms four vulture species occurring in Turkey viz., *Aegypius monachus*, *Gypaetus barbatus*, *Gyps fulvus* and *Neophron percnopterus* can all be seen in Erzurum Marshes. The inhabitants of Erzurum were almost ignorant of the fascinating bird diversity and their habitat that exists at Erzurum Marshes and that they were sitting on a gold mine of touristic attraction

Erzurum Marshes meet the criteria and of wetlands according to Ramsar and Wetland criteria that it is a very important habitat hosting significant level of bird population especially in migration periods, and could be a candidate to be declared a Ramsar site under the Ramsar Convention on the Wetlands of International Importance. The site hosts significant levels of bird population especially during migration. Despite the fact that Erzurum Marshes were

given the wetland protection status by National Wetlands Commission in 2006, no protective activity was observed during the present study and that protective measures must be taken immediately.

The leading factor threatening the region and also the bird species is the deterioration of habitats that also support other important forms of life including the plants. This deterioration is mainly caused by drainage channels, livestock grazing, Erzurum airport, urbanization, high-voltage transmissions, poaching, use of peat and other sources, deterioration of water sources, use of pesticides in agriculture, recreational use, seasonal accommodation, apicultural activities, stone pit and rock hounding, frost, and hail (Sari, 2010; Sari *et al.*, 2013).

## CONCLUSIONS

As a result of the studies carried out to date, the occurrence of 504 bird species in Turkey has been determined. Considering that the number of bird species observed in Erzurum Marshes is 239 i.e. 42.7%-almost half of the bird species recorded in Turkey, it can be seen how an important wetland the marsh is for Turkey and the World. Measurements must be taken against threat risks to protect This Important Bird Area. Drainage channels must be removed from the field and the plain must regain its previous form. No pasturage should be allowed in regions of the marsh, which are important as the bird habitat. Besides that, the pasturage activities must be performed in a controlled and planned manner in other regions of the marsh and in other pastures in surroundings. Especially after melting of snows, animals must not be allowed into the field while the grasses are just germinating. Erzurum Airport may not be enlarged further, and it would be better to translocate it to a far off location. Further urbanization towards the marshes must be stopped, and new buildings must not be allowed in this direction anymore. Alternative roads must be determined, all the roads dividing the integrity of field must be eliminated in long-term, and the heavy traffic problem must be solved via alternative motorways to be constructed. The route of high-voltage transmissions line passing through the field must be changed.

Study area is not within the scope of hunting ban. The field should immediately be registered into the hunting-ban areas. Use of peat should be prevented. The reasons of local people for using peat should be determined and, if possible, the solution/suggestions should be offered for eliminating those reasons. Deterioration of water sources should not be allowed. No recreational use should be allowed. Other places should be offered for accommodation of temporary workers coming from other



cities to Erzurum, and their entrance into this region should be prevented. For apicultural activities executed within the borders of Erzurum Marshes, alternative locations should be offered, and such activities should not be allowed in this field. Stone quarries should be closed, and collecting stones should be prevented. Against the frost and hail damages, the large marshy areas and reedy regions should be enlarged as they were used to be in the past.

#### Statement of conflict of interest

Authors have declared no conflict of interest.

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