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*Araştırma Makalesi / Research Article*

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## Ornithofauna of Ardahan Province (Turkey)

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### Abstract

In this research, bird species in Ardahan Province were examined. The research which kept nearly two years occurred between February 2017 and June 2018. Consequently on the observations 175 species and 2 subspecies were listed in 43 families. It was discovered that 40,7% (sp:72) of these species were resident, 27,7% (sp: 49) were summer visitors, 9,0% (sp: 16) were winter visitors and 22,6% (sp:40) were transit migrant species. Last assessment of these bird species considering to IUCN criteria; it was seen that 1 species were EN (Endangered), 9 species were NT (Near Threatened), 5 species were VU (Vulnerable), 159 species were LC (Least concern) and 3 species was not in scope. In addition, important bird areas (Kura River, Çıldır Lake, Aktaş Lake, Putka (Sazara) Lake, Kuşçmaz Lake, Lavaş Lake, Göle Plain and Ardahan Forests) were observed in Ardahan Province.

**Keywords:** Ardahan, Birds, Ornithofauna, Wetland.

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## Ardahan İli Ornitofaunası (Türkiye)

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### Özet

Bu araştırmada, Ardahan (Türkiye) İli'nin kuş türleri incelenmiştir. Yaklaşık iki yıl süren araştırma Şubat 2017-Haziran 2018 ayları arasında gerçekleştirildi. Gözlemler sonucunda 43 familyaya ait 175 tür ve 2 alttür listelendi. Bu türlerin % 40,7 (Tür: 72) Yerli, % 27,7 (Tür: 49) Yaz ziyaretçisi, % 9,0 (Tür: 16) Kış ziyaretçisi, % 22,6 (Tür: 40) Transit göçer olduğu belirlendi. Bu kuş türlerinin IUCN kriterlerine göre değerlendirilmesi sonucunda; 1 türün tehlike altında (EN-Endangered), 9 türün tehlikeye açık (NT-Near threatened), 5 türün Hassas (VU-Vulnerable), 159 türün düşük riskli (LC-Least concern) statüsünde ve 3 türün kapsamda olmadığı görüldü. Ayrıca Ardahan İli için kuşların yoğun görüldüğü önemli kuş alanları (Kura Nehri, Çıldır Gölü, Aktaş Gölü, Putka (Sazara) Gölü, Kuşçmaz Gölü, Lavaş Gölü, Göle Ovası ve Ardahan Ormanları) da tespit edildi.

**Anahtar kelimeler:** Ardahan, Kuşlar, Ornitofauna, Sulak alan.

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### 1. Introduction

Anatolia is highly rich in biodiversity due to the diverse geographical characteristics and the habitats. The endemism phenomenon, in addition to the rich diversity, enables the natural structure of Anatolia even more attractive. The diversity in natural structures causes Anatolia having a continental characteristic [1, 2].

Turkey, constituting a part of the Palearctic region, serves as the bridge between Europe, Asia and Africa on bird migration routes. Our country has a great importance for bird fauna because of having different climatic conditions and different habitats due to the geographical location. Turkey is quite rich also in terms of important bird habitats. Therefore, our country has a very important place for bird species [3].

Ornithological researches conducted in Anatolia date back to the 1880s. The general characteristics of the species observed in our country had been discussed in the study titled "Important Developments in Anatolian Birds", and the general species list was prepared in this report [4]. The first study in our country is "Turkey Birds" which has served as a valuable source for many years to the

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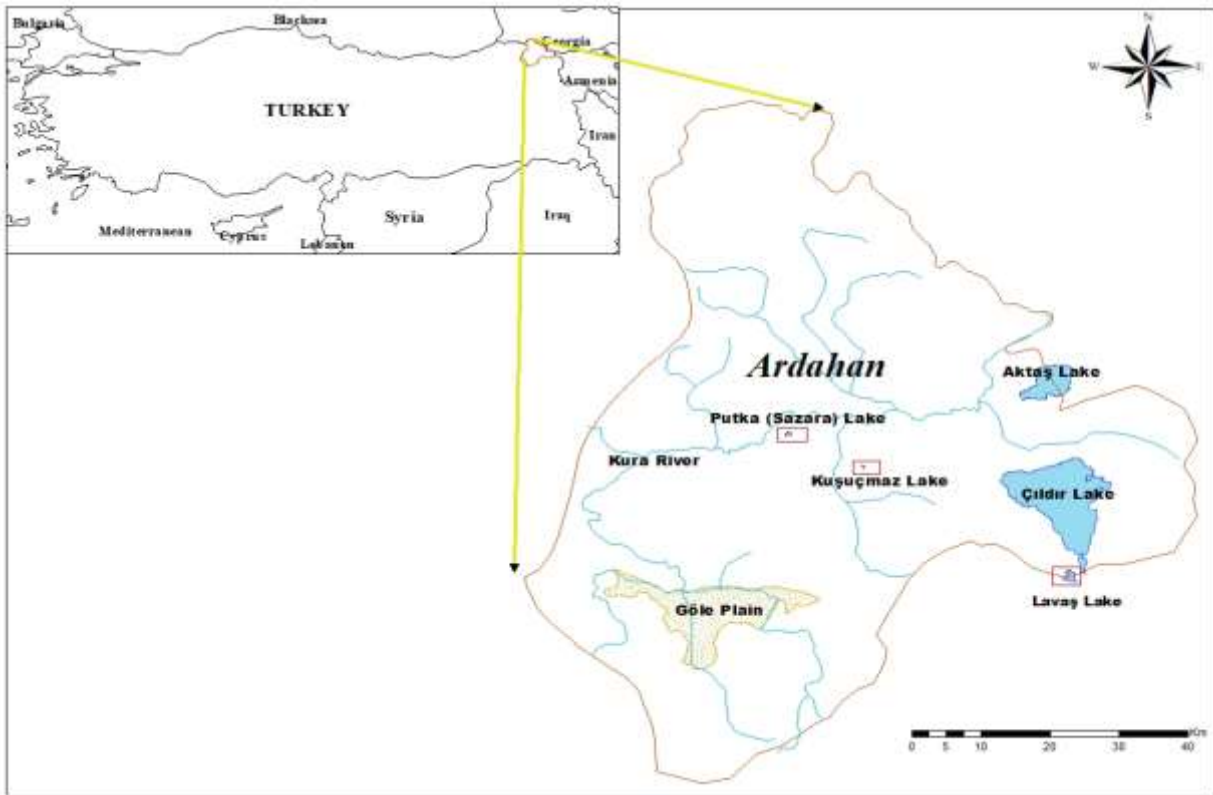
ornithologists [5]. Different numbers reported on various dates for the bird list of Turkey is noteworthy. The number of bird species in 1990 was 421, while this number including the random species in 2015 was increased up to 513 [6-9]. Studies on the habitats of conservation and survival of the species increased with the acceleration of ornithological studies and a book titled "Turkey's Important Bird Areas" was published. The information on 79 Important Bird Habitats (IBH) within the boundaries of Turkey was presented in this study which was updated in 2004 [10,11].

Ardahan province has several wetlands that birds frequently visit. Çıldır Lake, Aktas Lake and Ardahan Forests which are among the Important Natural Habitats (INH), are located within the borders of Ardahan province and host many bird species [12]. Many sources indicated that Aktas Lake is the only habitat in the country where *Pelicanus crispus* (Dalmatian pelican) and *Pelecanus onocrotalus* (Great white pelican) breed together [13, 14]. The region provides feeding and breeding opportunities to the species due the hosting many habitat types located in the transition zone of migratory birds. Thus, the region becomes one of the most frequently visiting places of birds. Therefore, the wetland potential and the bird species of the region have been considered worthy to investigate.

## 2. Material ve Methods

This study was conducted in Ardahan province between February 22, 2017 and June 26, 2018 (Figure 1). A total of 40 days of field study was carried out. The research material was the bird species living in the Ardahan province. The list of bird species for Ardahan province was prepared, and the migration status, IUCN criterion, Bern and CITES statuses of each identified species were also investigated. In addition, the important habitats and threats for birds within the province were also identified.

The methods used in detecting the birds of the area were Squares (Raster Carding) [15] and Observation along a Line Transect-Point Observation Method (Point Counts) [16]. Topographic map (scale 1: 25.000), land observation cards, binoculars, telescope, numerator, camera, GPS (Global Positioning System), marsh garments and diagnostic books were used in the studies [9, 18].



**Figure 1.** Important bird areas in Ardahan province

### 3. Results

A total of 177 birds, including 175 bird species belonging to 43 families and 2 (*Buteo buteo vulpinus*-Steppe Buzzard, *Motacilla flava feldegg*-Masked wagtail) subspecies were identified in the study area. The species determined in the study area composed of Residents 40.7%, (n: 72), Summer Visitors 27.7% (n: 49), Winter Visitors 9.0% (n: 16) and Transit Migrants 22.6% (n: 40).

The status of species according to IUCN criteria were identified as follows; 1 species is EN (*Neophron percnopterus*-Egyptian vulture), 4 species is VU (*Aythya ferina*- Common pochard, *Aquila heliaca*- Eastern Imperial Eagle, *Streptopelia turtur*- European turtle-dove, *Branta ruficollis*, Red-breasted goose) 10 species is NT (*Pelecanus crispus*- Dalmatian pelican, *Aythya nyroca*- Ferruginous duck, *Gypaetus barbatus*- Lammergeier, *Aegypius monachus*- Cinereous vulture, *Falco vespertinus*- Red-footed falcon, *Lyrurus mlokosiewiczii*- Caucasian grouse, *Haematopus ostralegus*-Eurasian oystercatcher, *Vanellus vanellus*-Northern lapwing, *Larus armenicus*-Armenian gull, *Anthus pratensis*-Meadow pipit) and 159 species is LC. Three species (*Buteo buteo vulpinus*- Steppe buzzard, *Motacilla flava feldegg*-Masked wagtail, *Corvus cornix*-Carrion crow) could not listed according to IUCN criteria (Table 1).

**Table 1.** Bird species and their status determined in Ardahan province

Family	Scientific Species Name	English Species Name	IUCN	CITES	Region Status
Podicipedidae	<i>Tachybaptus ruficollis</i>	Little Grebe	LC	Out of Scope	R
	<i>Podiceps cristatus</i>	Great Crested Grebe	LC	Out of Scope	R
	<i>Podiceps grisegena</i>	Red-necked Grebe	LC	Out of Scope	SV
	<i>Podiceps nigricollis</i>	Black-necked Grebe	LC	Out of Scope	R
	<i>Ixobrychus minutus</i>	Little Bittern	LC	Out of Scope	T
	<i>Ardeola ralloides</i>	Squacco Heron	LC	Out of Scope	SV
Ardeidae	<i>Nycticorax nycticorax</i>	Black-crowned Night-heron	LC	Out of Scope	T
	<i>Bubulcus ibis</i>	Cattle Egret	LC	Out of Scope	R
	<i>Egretta garzetta</i>	Little Egret	LC	Out of Scope	WV
	<i>Ardea alba</i>	Great Egret	LC	Out of Scope	T
	<i>Ardea cinerea</i>	Grey Heron	LC	Out of Scope	R
	<i>Ardea purpurea</i>	Purple Heron	LC	Out of Scope	T
Pelecanidae	<i>Pelecanus onocrotalus</i>	Great White Pelican	LC	Out of Scope	SV
	<i>Pelecanus crispus</i>	Dalmatian Pelican	NT	Annex I	R
Phalacrocoracidae	<i>Phalacrocorax carbo</i>	Great Cormorant	LC	Out of Scope	WV
Threskiornithidae	<i>Plegadis falcinellus</i>	Glossy Ibis	LC	Out of Scope	R
Ciconiidae	<i>Ciconia nigra</i>	Black Stork	LC	Annex II	T
	<i>Ciconia ciconia</i>	White Stork	LC	Out of Scope	SV
	<i>Anser albifrons</i>	Greater White-fronted Goose	LC	Out of Scope	T
Anatidae	<i>Anser anser</i>	Greylag Goose	LC	Out of Scope	SV
	<i>Branta ruficollis</i>	Red-breasted Goose	VU	Annex II	T
	<i>Tadorna ferruginea</i>	Ruddy Shelduck	LC	Out of Scope	SV
	<i>Mareca strepera</i>	Gadwall	LC	Out of Scope	R
	<i>Anas crecca</i>	Common Teal	LC	Out of Scope	R
	<i>Anas platyrhynchos</i>	Mallard	LC	Out of Scope	R
	<i>Anas acuta</i>	Northern Pintail	LC	Out of Scope	T
	<i>Spatula querquedula</i>	Garganey	LC	Out of Scope	SV
	<i>Spatula clypeata</i>	Northern Shoveler	LC	Out of Scope	SV
	<i>Aythya ferina</i>	Common Pochard	VU	Out of Scope	R
	<i>Aythya nyroca</i>	Ferruginous Duck	NT	Out of Scope	R
	<i>Aythya fuligula</i>	Tufted Duck	LC	Out of Scope	R
	<i>Aythya marila</i>	Greater Scaup	LC	Out of Scope	WV
	<i>Milvus migrans</i>	Black Kite	LC	Annex II	T
Accipitridae	<i>Gypaetus barbatus</i>	Lammergeier	NT	Annex II	R
	<i>Neophron percnopterus</i>	Egyptian Vulture	EN	Annex II	R

Family	Scientific Species Name	English Species Name	IUCN	CITES	Region Status
	<i>Gyps fulvus</i>	Griffon Vulture	LC	Annex II	R
	<i>Aegypius monachus</i>	Cinereous Vulture	NT	Annex II	R
	<i>Circaetus gallicus</i>	Short-toed Snake-eagle	LC	Annex II	SV
	<i>Circus aeruginosus</i>	Western Marsh-harrier	LC	Annex II	R
	<i>Circus cyaneus</i>	Northern or Hen Harrier	LC	Annex II	T
	<i>Circus pygargus</i>	Montagu's Harrier	LC	Annex II	SV
	<i>Accipiter gentilis</i>	Northern Goshawk	LC	Annex II	R
	<i>Accipiter nisus</i>	Eurasian Sparrowhawk	LC	Annex II	R
	<i>Buteo buteo</i>	Common Buzzard	LC	Annex II	R
	<i>Buteo buteo vulpinus</i>	Steppe Buzzard	NL	Out of Scope	SV
	<i>Buteo rufinus</i>	Long-legged Buzzard	LC	Annex II	R
	<i>Buteo lagopus</i>	Rough-legged Hawk	LC	Annex II	R
	<i>Clanga pomarina</i>	Lesser Spotted Eagle	LC	Annex II	SV
	<i>Aquila heliaca</i>	Eastern Imperial Eagle	VU	Annex I	T
	<i>Aquila chrysaetos</i>	Golden Eagle	LC	Annex II	R
	<i>Hieraetus pennatus</i>	Booted Eagle	LC	Annex II	SV
	<i>Falco naumanni</i>	Lesser Kestrel	LC	Annex II	SV
Falconidae	<i>Falco tinnunculus</i>	Common Kestrel	LC	Annex II	R
	<i>Falco vespertinus</i>	Red-footed Falcon	NT	Annex II	T
	<i>Falco subbuteo</i>	Eurasian Hobby	LC	Annex II	SV
	<i>Lyrurus mlokosiewiczi</i>	Caucasian Grouse	NT	Out of Scope	R
Phasianidae	<i>Alectoris chukar</i>	Chukar Partridge	LC	Out of Scope	R
	<i>Perdix perdix</i>	Grey Partridge	LC	Out of Scope	R
Rallidae	<i>Gallinula chloropus</i>	Common Moorhen	LC	Out of Scope	R
	<i>Fulica atra</i>	Common Coot	LC	Out of Scope	R
Gruidae	<i>Grus grus</i>	Common Crane	LC	Annex II	T
	<i>Himantopus himantopus</i>	Black-winged Stilt	LC	Out of Scope	R
Recurvirostridae	<i>Charadrius dubius</i>	Little Ringed Plover	LC	Out of Scope	SV
	<i>Charadrius alexandrinus</i>	Kentish Plover	LC	Out of Scope	SV
	<i>Vanellus vanellus</i>	Northern Lapwing	NT	Out of Scope	SV
	<i>Calidris minuta</i>	Little Stint	LC	Out of Scope	T
	<i>Calidris alpina</i>	Dunlin	LC	Out of Scope	WV
	<i>Philomachus pugnax</i>	Ruff	LC	Out of Scope	SV
	<i>Limosa limosa</i>	Black-tailed Godwit	NT	Out of Scope	WV
Scolopacidae	<i>Tringa totanus</i>	Common Redshank	LC	Out of Scope	SV
	<i>Tringa ochropus</i>	Green Sandpiper	LC	Out of Scope	T
	<i>Tringa glareola</i>	Wood Sandpiper	LC	Out of Scope	T
	<i>Actitis hypoleucos</i>	Common Sandpiper	LC	Out of Scope	SV
	<i>Tringa stagnatilis</i>	Marsh Sandpiper	LC	Out of Scope	T
	<i>Tringa nebularia</i>	Common Greenshank	LC	Out of Scope	T
	<i>Larus ridibundus</i>	Black-headed Gull	LC	Out of Scope	WV
Laridae	<i>Larus armenicus</i>	Armenian Gull	NT	Out of Scope	R
	<i>Gelochelidon nilotica</i>	Gull-billed Tern	LC	Out of Scope	R
	<i>Sterna hirundo</i>	Common Tern	LC	Out of Scope	T
	<i>Columba livia</i>	Rock Pigeon	LC	Out of Scope	R
Columbidae	<i>Columba palumbus</i>	Common Wood-pigeon	LC	Out of Scope	SV
	<i>Streptopelia decaocto</i>	Eurasian Collared-dove	LC	Out of Scope	R
	<i>Streptopelia turtur</i>	European Turtle-dove	VU	Out of Scope	SV
Cuculidae	<i>Cuculus canorus</i>	Common Cuckoo	LC	Out of Scope	T
	<i>Otus scops</i>	Common Scops-owl	LC	Annex II	SV
Strigidae	<i>Bubo bubo</i>	Eurasian Eagle-owl	LC	Annex II	R
	<i>Athene noctua</i>	Little Owl	LC	Annex II	R

Family	Scientific Species Name	English Species Name	IUCN	CITES	Region Status
	<i>Asio otus</i>	Long-eared Owl	LC	Annex II	R
	<i>Asio flammeus</i>	Short-eared Owl	LC	Annex II	R
Apodidae	<i>Apus apus</i>	Common Swift	LC	Out of Scope	SV
	<i>Tachymarptis melba</i>	Alpine Swift	LC	Out of Scope	T
Meropidae	<i>Merops apiaster</i>	European Bee-eater	LC	Out of Scope	T
Coraciidae	<i>Coracias garrulus</i>	European Roller	LC	Out of Scope	T
Upupidae	<i>Upupa epops</i>	Eurasian Hoopoe	LC	Out of Scope	SV
Picidae	<i>Dendrocopos syriacus</i>	Syrian Woodpecker	LC	Out of Scope	R
	<i>Melanocorypha calandra</i>	Calandra Lark	LC	Out of Scope	R
	<i>Melanocorypha bimaculata</i>	Bimaculated Lark	LC	Out of Scope	R
Alaudidae	<i>Galerida cristata</i>	Crested Lark	LC	Out of Scope	R
	<i>Lullula arborea</i>	Wood Lark	LC	Out of Scope	WV
	<i>Alauda arvensis</i>	Eurasian Skylark	LC	Out of Scope	WV
	<i>Eremophila alpestris</i>	Horned Lark	LC	Out of Scope	R
	<i>Riparia riparia</i>	Sand Martin	LC	Out of Scope	SV
	<i>Ptyonoprogne rupestris</i>	Eurasian Crag	LC	Out of Scope	SV
Hirundinidae	<i>Hirundo rustica</i>	Barn Swallow	LC	Out of Scope	SV
	<i>Delichon urbicum</i>	Northern House-martin	LC	Out of Scope	SV
	<i>Cecropis daurica</i>	Red-rumped Swallow	LC	Out of Scope	SV
	<i>Anthus campestris</i>	Tawny Pipit	LC	Out of Scope	SV
	<i>Anthus pratensis</i>	Meadow Pipit	NT	Out of Scope	T
	<i>Anthus cervinus</i>	Red-throated Pipit	LC	Out of Scope	SV
	<i>Anthus spinoletta</i>	Water Pipit	LC	Out of Scope	R
Motacillidae	<i>Motacilla flava</i>	Yellow Wagtail	LC	Out of Scope	SV
	<i>Motacilla flava feldegg</i>	Masked Wagtail	NL	Out of Scope	SV
	<i>Motacilla citreola</i>	Citrine Wagtail	LC	Out of Scope	T
	<i>Motacilla cinerea</i>	Grey Wagtail	LC	Out of Scope	WV
	<i>Motacilla alba</i>	White Wagtail	LC	Out of Scope	R
Cinclidae	<i>Cinclus cinclus</i>	White-throated Dipper	LC	Out of Scope	R
Troglodytidae	<i>Troglodytes troglodytes</i>	Winter Wren	LC	Out of Scope	T
Prunellidae	<i>Prunella modularis</i>	Hedge Accentor	LC	Out of Scope	R
	<i>Muscicapa striata</i>	Spotted Flycatcher	LC	Out of Scope	T
	<i>Cercotrichas galactotes</i>	Rufous-tailed Scrub-robin	LC	Out of Scope	T
	<i>Erithacus rubecula</i>	European Robin	LC	Out of Scope	T
	<i>Luscinia megarhynchos</i>	Common Nightingale	LC	Out of Scope	SV
	<i>Phoenicurus ochruros</i>	Black Redstart	LC	Out of Scope	WV
Muscicapidae	<i>Phoenicurus phoenicurus</i>	Common Redstart	LC	Out of Scope	SV
	<i>Saxicola rubetra</i>	Whinchat	LC	Out of Scope	T
	<i>Saxicola torquatus</i>	Common Stonechat	LC	Out of Scope	WV
	<i>Oenanthe isabellina</i>	Isabelline Wheatear	LC	Out of Scope	SV
	<i>Oenanthe oenanthe</i>	Northern Wheatear	LC	Out of Scope	T
	<i>Oenanthe hispanica</i>	Black-eared Wheatear	LC	Out of Scope	SV
	<i>Monticola saxatilis</i>	Rufous-tailed Rock-thrush	LC	Out of Scope	R
	<i>Turdus torquatus</i>	Ring Ouzel	LC	Out of Scope	R
Turdidae	<i>Turdus merula</i>	Eurasian Blackbird	LC	Out of Scope	R
	<i>Turdus viscivorus</i>	Mistle Thrush	LC	Out of Scope	R
	<i>Acrocephalus schoenobaenus</i>	Sedge Warbler	LC	Out of Scope	SV
Acrocephalidae	<i>Acrocephalus scirpaceus</i>	Eurasian Reed-warbler	LC	Out of Scope	SV
	<i>Acrocephalus arundinaceus</i>	Great Reed-warbler	LC	Out of Scope	T
	<i>Sylvia melanocephala</i>	Sardinian Warbler	LC	Out of Scope	T
Sylviidae	<i>Sylvia curruca</i>	Lesser Whitethroat	LC	Out of Scope	T
	<i>Sylvia communis</i>	Common Whitethroat	LC	Out of Scope	T

Family	Scientific Species Name	English Species Name	IUCN	CITES	Region Status
	<i>Sylvia atricapilla</i>	Blackcap	LC	Out of Scope	WV
Phylloscopidae	<i>Phylloscopus collybita</i>	Common Chiffchaff	LC	Out of Scope	R
	<i>Phylloscopus trochilus</i>	Willow Warbler	LC	Out of Scope	T
Paridae	<i>Parus ater</i>	Coal Tit	LC	Out of Scope	R
	<i>Cyanistes caeruleus</i>	Blue Tit	LC	Out of Scope	R
	<i>Parus major</i>	Great Tit	LC	Out of Scope	R
Sittidae	<i>Sitta krueperi</i>	Krueper's Nuthatch	LC	Out of Scope	R
	<i>Sitta europaea</i>	Wood Nuthatch	LC	Out of Scope	T
Certhiidae	<i>Sitta neumayer</i>	Western Rock-nuthatch	LC	Out of Scope	R
	<i>Certhia brachydactyla</i>	Short-toed Treecreeper	LC	Out of Scope	R
Laniidae	<i>Lanius excubitor</i>	Great Grey Shrike	LC	Out of Scope	WV
	<i>Lanius collurio</i>	Red-backed Shrike	LC	Out of Scope	SV
	<i>Lanius minor</i>	Lesser Grey Shrike	LC	Out of Scope	SV
	<i>Lanius senator</i>	Woodchat Shrike	LC	Out of Scope	T
Corvidae	<i>Garrulus glandarius</i>	Eurasian Jay	LC	Out of Scope	R
	<i>Pica pica</i>	Black-billed Magpie	LC	Out of Scope	R
	<i>Corvus monedula</i>	Eurasian Jackdaw	LC	Out of Scope	R
	<i>Corvus frugilegus</i>	Rook	LC	Out of Scope	R
	<i>Corvus cornix</i>	Carrion Crow	NL	Out of Scope	R
Sturnidae	<i>Corvus corax</i>	Common Raven	LC	Out of Scope	R
	<i>Sturnus vulgaris</i>	Common Starling	LC	Out of Scope	WV
Passeridae	<i>Pastor roseus</i>	Rosy Starling	LC	Out of Scope	SV
	<i>Passer domesticus</i>	House Sparrow	LC	Out of Scope	R
	<i>Petronia petronia</i>	Rock Sparrow	LC	Out of Scope	R
	<i>Montifringilla nivalis</i>	White-winged Snowfinch	LC	Out of Scope	SV
Fringillidae	<i>Fringilla coelebs</i>	Eurasian Chaffinch	LC	Out of Scope	R
	<i>Fringilla montifringilla</i>	Brambling	LC	Out of Scope	T
	<i>Chloris chloris</i>	European Greenfinch	LC	Out of Scope	R
	<i>Carduelis carduelis</i>	European Goldfinch	LC	Out of Scope	R
	<i>Linaria cannabina</i>	Eurasian Linnet	LC	Out of Scope	R
	<i>Carpodacus erythrinus</i>	Common Rosefinch	LC	Out of Scope	SV
	<i>Pyrrhula pyrrhula</i>	Eurasian Bullfinch	LC	Out of Scope	WV
	<i>Emberiza citrinella</i>	Yellowhammer	LC	Out of Scope	WV
Emberizidae	<i>Emberiza cia</i>	Rock Bunting	LC	Out of Scope	SV
	<i>Emberiza hortulana</i>	Ortolan Bunting	LC	Out of Scope	SV
	<i>Emberiza buchanani</i>	Grey-necked Bunting	LC	Out of Scope	T
	<i>Emberiza melanocephala</i>	Black-headed Bunting	LC	Out of Scope	SV
	<i>Emberiza calandra</i>	Corn Bunting	LC	Out of Scope	R

R: Resident, WV: Winter Visitors, SV: Summer Visitors, T: Transit Göçer, LC: Least Concern, NT: Near Threatened, VU: Vulnerable, EN: Endangered NL: Not Listed

The results indicated 8 important habitats in Ardahan province that are frequently visited by the birds. These areas are Kura River, Çıldır Lake, Aktaş Lake, Putka (Sazara) Lake, Kuşçmaz Lake, Lavaş Lake, Göle Plain and Ardahan Forests (Figure 1). The species identified use these areas for resting, safety, breeding, feeding and daily displacement activities. In addition, factors threatening both these areas and the livings in these areas were also investigated.

#### 4. Discussion and Conclusion

In this study 177 bird species were identified in the study area. The population of little vulture (*Neophron percnopterus*) and the Dalmatian pelican (*Pelecanus crispus*) bird species is globally decreasing according to IUCN list. Common pochard (*Aythya farina*), Turtle dove (*Streptopelia turtur*) and Siberian goose (*Branta ruficollis*) included in VU status (Vulnerable), are hunted in the region. These species are

under a heavy hunting pressure. Eastern Imperial Eagle (*Aquila heliaca*) is another rarely observed endangered species. One hundred twenty one of the 177 bird species identified in the area breed within the province borders.

Eight habitats were determined as commonly preferred areas of the birds in Ardahan province. Dalmatian pelican and Great White pelican species incubate together on a small island in Aktaş Lake which is one of the commonly preferred areas of birds in Ardahan. Since both species usually breed in different locations, this is a rarely encountered situation. The simultaneous incubation of two species on the island can be explained by the safety of the island. Wetlands, which are very active in summer, are completely covered by snow in winter months.

Aktaş Lake has been reported as the breeding place especially for the Dalmatian pelicans (*Pelecanus crispus*) and that 20 to 35 couples are reported constantly breeding [12-14]. Our study confirmed the importance of Aktaş Lake for pelican species once more. Pelicans were observed breeding on islands in the lake and spreading throughout the lake basin.

The number of bird species recently has increased highly with the acceleration of ornithological studies in Turkey. The number of bird species in Turkey ornitofauna was initially reported as 421 in 1990. The number has increased to 513 bird species including the most recent random species due to the increasing number reports of from researchers [6-9]. The species obtained in our study completely coincide with the species reported in the previous studies. However, some differences in distribution and status have also been encountered. In addition, the number of bird species is expected to increase with the future studies conducted in Ardahan province.

Many living species are threatened with extinction worldwide due to various reasons. Habitat problems are the primary causes for the extinction of living species. The degraded or weakened habitat characteristics and habitat losses accelerate the extinction process. Therefore, the bird species identified within the borders of Ardahan province should be conserved together with their habitats. Greater attention should be given to the habitats where endangered species live. The results revealed that Kura River, Çıldır Lake, Aktaş Lake, Putka (Sazara) Lake, Kuşuçmaz Lake, Lavaş Lake, Göle Plain and Ardahan Forests are the important habitats within the province and need to be carefully conserved.

The influence of an important bird migration route and containing the habitats attracting birds reveals the ornithological importance of Ardahan province. The regions where the population of birds and other wild animals are dense are mostly under human and domestic animal pressure. Hunting, agricultural activities, reed cutting, grazing, drainage and drying were as identified as the major elements of destruction in the study area.

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### **Author's Contributions**

Erkan AZİZOĞLU and Özdemir ADİZEL designed the study, performed identification of bird species, data analysis and writing of the manuscript.

### **Statement of Conflicts of Interest**

The authors declare that there is no conflict of interest.

### **Statement of Research and Publication Ethics**

The authors declares that this study complies with Research and Publication Ethics.

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