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Evaluation of Wetlands in the East Anatolia Region

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Abstract: Turkey is in the first place among the European and Middle Eastern Countries, expect the Independent States Association, regarding with wetlands. Eastern Anatolia region has special importance in wetlands because of its high potential around the country. A great amount of significant bird areas is wetlands. The main point of this study was to evaluate 31 wetlands along the East Anatolia Region in respect to size of wetland, present bird species, positive and negative effects on the local environment.

Key words: Wetlands, watersheds, biodiversity, East Anatolia Region, Turkey

INTRODUCTION

Wetlands, the most threatened areas among the habitats, include large and small lakes, rivers, swamps, deltas and coastal regions, where biodiversity and production are in their maximum. Wetlands are playing an important role in the lives of the people who survive dwell around them and they are big source of income for the economy of the countries. These regions are important and distinctive for the conservation of natural balance[1,2].

Turkey is the richest country in Europe and the Middle East Independent States Federation for wetlands[1,3]. Turkey is among the most important countries where the significant biological reserves, gene reserves and ecosystems are present. Nowadays, being as a developing country, Turkey has to bring up projects for the use of natural sources in addition to improvements in economy, industry, education and many others. Conservation of existing natural sources, plants, animals and microorganisms and consequently, physical environment [in which these are present] is essential for development[4,7].

There have been no productive studies on wetlands as on other natural values of country. For this reason, location of many wetlands is unknown so, their values have not been detected yet. In the study, the wetlands of the East Anatolia Region were evaluated for common features such as location, importance, the problems encountered and conservation involvement of the wetlands in the area. Overall goal of this study is to make people aware of wetlands and to increase consciousness.

MATERIALS AND METHODS

This study was carried out in the Eastern Anatolia Region of Turkey during the summer months of 2002-2004. The East Anatolia Region is the largest geographic region of Turkey. It covers about 163 km^2 area which is equal to 21% of whole of Turkey (Fig. 1). It is the regions of Turkey with an elevation of 200 m from the sea level.

Thirty one wetlands (an area of approximately 803.980 ha) in 4 watersheds in 12 towns were evaluated in this study (Fig. 2). The study method was based on surveys, data obtaining, analysis, synthesis and evaluation. Natural and cultural properties were also determined by surveys and data obtaining (maps, photographs, plans, documents, internet and interviewing authorities) and on-site observation and measurement.

RESULTS AND DISCUSSION

The watersheds studied are located in the Northeast bird road. In the Eastern part of Black Sea Region, more than 200,000 birds are flying through the East Anatolia by passing over the River Coruh in the autumn immigrations which is between the last week of August and the second week of October. Some birds fly toward Van Lake and Yuksekova while more crowded piles fly to Kahramanmaras and Antakya in the direction of south west. This immigration over Turkey is the biggest bird of prey immigration in the West Paleactric Zone. During this seven week immigration period millions of singing birds also follow this route[5].

Van interior watershed: It consists 11 wetlands with an area of 428.523 ha (Table 1). Van, Ercek and Nazik Lakes

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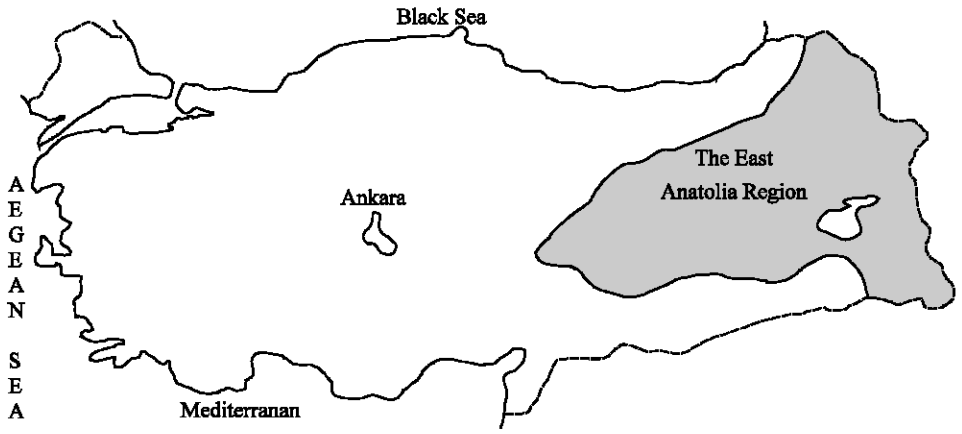

Fig. 1: Location of study area

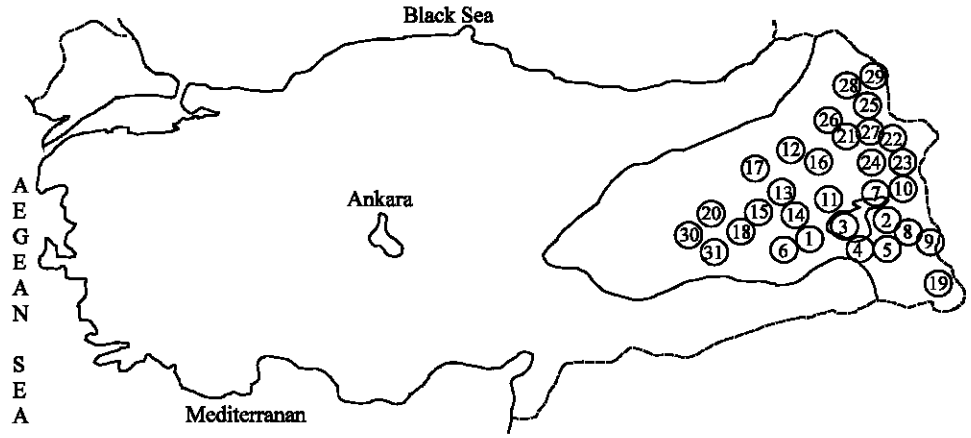

Fig. 2: The wetlands in the East Anatolia region

were formed by the volcanic blockage of the streams of flowing in the banks formed by the tectonic activities.

The Interior Watershed of Van Lake, which can not flow its water into near seas, is the largest interior watershed following the Interior Watershed of Middle Anatolia. Van Lake has the largest surface area in Turkey; it is the 13th among the biggest interior lakes all over the world and the biggest of the lakes with sodium carbonated water. Wild life in the water of the lake is restricted by soda which relatively adapted to sodium carbonated water, can grow up in the lake. Although the lake, not suitable for drinkable and irrigation water supply, has a big potential of transportation, water sports, recreation and tourism. It is utilized at a low level. Among the lakes in the region, only Van Lake is conserved. All others in the area have the problems such as pollution, soil erosion and interference of water supply regimes. In Ercek Lake, exotic species were implanted but it could not be achieved.

Dicle watershed: It comprises two wetlands and has an area of 24.900 ha (Table 1). This watershed is a natural area where Fırat turtles, red-wattled plover (*Hoplopterus indicus*), kingfisher (*Alcedo atthis*) survive. Yuksekova includes has the highest wetland of Turkey. Wetlands are getting smaller in the purpose of expanding the agricultural areas. In addition, it receives people of immigration.

Fırat watershed: It includes 8 wetlands and an area of 142.461 ha (Table 1). There is no area in conservation status except Otlukbeli Lake in the Watershed. Dams built in area are changing the wildlife. Eksi Su, in the west of Erzincan Plain, has the properties which are sufficient to make it Ramsar area because of the population of birds

Table 1: The wetlands on the East Anatolia region[8,9]

Water-shed		Wetlands	City	County	Area (ha)	Ecological characteristics	Human activities	Problems	Protection statute
The Van water shed	1	Nemrut lake	Bitlis	Tatvan, Guroymak	4500	Velvet Scoter (*Melanitte fusca)* and Golden Eagle (*Aquila chrysaetos)*			There is no protection status
	2	Ercek lake	Van	Van Centre	9520	Avocet (*Recurvirostra avosetta*), Greater Sand Plover *(Charadrius leschenaultii)*, Black-necked Grebe *(Podiceps nigricollis*) and Ruddy Shelduck *(Tadorna ferruginea)*	Animal husbandry Hunting Farming Recreation	Pollution Erosion Implanting exotic species	There is no protection status
	3	Van lake	Van Bitlis	Edremit,Tat Van, Gevas, Ahlat, Adilc-evaz,Ercis, Muradiye, Van Centre	390000	The biggest lake of Turkey. Marbled Teal (*Marmaronetta angustirostris*), Great Bustard (*Otis tarda*), Armenian Gull (*Larus armenicus*), The Special Fish of Van lake, Pearl Grey Mullet	Recreation Fishing Animal husbandry Farming	Pollution Erosion Interferences to water regime Tourism	Archaeological site
	4	Nazik lake	Van	Centre	4800	Fresh-water			There is no protection status
	5	Kesis lake (Turna lake)	Van	Centre	400				There is no protection status
	6	Arin lake	Bitlis	Acil cevaz	1500	Gadwall (*Anas strepera*), Red-crested Pochard (*Netta rufina*), White-headed Duck (*Oxyura leucocephala*), Great Bustard (*Otis tarda*)	Animal husbandry Farming	Hunting Erosion	There is no protection status
	7	Celebibagı marshy place	Van	Ercis	1238			Pollution	There is no protection status
	8	Edremit marshy place	Van	Edremit	1855	Dikkuyruk	Farming	Pollution	There is no protection status
	9	Cimenova lake	Van	Saray	9580	*Oxyura leucocephala*			There is no protection status
	10	Cicekli lake	Van	Muradiye	1736	*Grus grus*			There is no protection status
	11	Batmus lake (Cil Lake)	Bitlis	Ahlat	3394	*Grus grus*, *Chlidonias hybridus*	Animal husbandary		There is no protection status
The Firat water shed	12	Erzurum plain	Erzurum	Erzurum	3300	Fresh-water Lake, Marsh	Animal husbandry Farming		There is no protection status
	13	Haclı lake	Mus	Bulanık	2500	Spoonbill (*Platalea leucorodia,*), Gadwall (*Anas strepera)*, Ruddy Shelduck *(Tadorna ferruginea)*	Farming Fishing	Changing of the water regime	There is no protection status
	14	Bulanık lake	Mus	Bulanık	8000	Pygmy Cormorant (*Phalacrocorax carbo*), Crane (*Grus grus*), Gull-billed Turn (*Gelochelidon nilotica*),Caspian Tern *(Sterna caspia)* , Great Bustard (*Otis tarda*)	Animal husbandry Farming		There is no protection status
	15	Seki lake (Small hamurpet)	Mus	Varto	108800		Fishing	Hunting	There is no protection status
	16	Tortum lake	Erzurum	Tortum	1400		Animal husbandry Farming Hunting Fishing	Erosion Pollution	There is no protection status
	17	Eksisu marsh	Erzincan	Uzumlu	2371	*Bubulcus ibis*, *Grus grus*	Recreation	Construction Changing of the water regime	There is no protection status
	18	Iron marsh	Bitlis mus	Guroymak haskoy	16090	*Ardeola ralloides Rhodopechys githaginea*	Animal husbandry	Changing of the water regime	There is no protection status
The Dicele water shed	19	Yuksekova marsh	Hakkari	Yuksekova	24900	Crane (*Grus grus*), Great Bustard (*Otis tarda*), Marsh Harrier (*Circus æruginosus*), Purple Heron (*Ardea purpurea*)	Animal husbandry Farming	Pollution interferences to water regime	There is no protection status
The Aras water shed	20	Hazar lake	Elazıg	Elazıg Merkez, Maden, Sivrice	7 000	Black-necked Grebe (*Podiceps nigricollis)*, Coot (*Fulica atra*)	Recreation Farming Energy Production Fishing	Erosion Pollution Interferences to water regi-me implanting	Natural site

Table 1: Continue

							exotic species	
21	Sarısu marsh	Agrı	Patnos	4800	Crane (*Grus grus*)	Animal Husbandry Rush Cutting		There isno protection status
22	Ardahan forest	Ardahan	Ardahan Centre	2500	Forest, marsh Montagu's Harrier (*Circus pygargus*)	Animal Husbandry		There isno protection status
23	Aktas lake	Ardahan	Cıldır	2700	Dalmatian Pelican (*Pelecanus crispus*)	Fishing	Aktas board Human impacts	There isno protection status
24	Cıldır lake	Ardahan	Cıldır	14000	Bigger fresh-water lake in Eastern Anatolia	Fishing Animal Husbandry Recreation	Pollution Destruction of the Habitat Construction	There isno protection status
25	Kuyucuk lake	Kars	Arpacay	219	White- headed duck *(xyura leucocephala*), Red-necked Grebe (*Podiceps grisegena*), Black-necked Grebe (*Podiceps nigricollis*), Gadwall (*Anas strepera*), Coot *(Fulica atra*), Black-winged Stilt (*Himantopus himantopus*)	Animal Husbandry Farming		Water birds protection and production area Wild life protection area
26	Balık lake	Agrı	Centre Dogubeyazıt	3400	Velvet Scoter (*Melanitte fusca*), Fresh-water Lake	Fishing Farming		There isno protection status
27	Dogubeyazıt lake	Agrı	Dogubeyazıt	8750	Montagu's Harrier (*Circus pygargus*)	Animal Husbandry Marsh Cutting	Interferences to water regime	There isno protection status
28	Aygır lake	Kars	Gole	2941	Fresh-water			There isno protection status
29	Deniz lake (Cengli lake)	Kars	Kagızman	112500		Fishing		There isno protection status
30	Karakaya dam	Malatya Elazıg	Kale Battalgazi	9148	*Podiceps cristatus*, *Atyhya nyroca* and *Fulica atra*	Fishing		There isno protection status
31	Keban dam	Elazıg	Kovacılar Palu Maden	47140	*Larus armenica*, *Sterna caspia*			Natural site

such as crane (*Grus grus*, gloosy ibis (*Plegadis falcinellus*) and bull heron. The natural balance of Eksi Su is about to be corrupted because of the heavy construction in Erzincan, overgrazing in winter and drainage.

Valley Murat includes the widest natural steppes and flood plains in East Anatolia Region. Because of the construction of the dam in the west of Bulanık Plain and transition from traditional weed cutting techniques to the techniques employing engine, the flood area plains and steppes are getting devastated.

Aras watershed: It comprises 12 wetlands and an area of 208098 ha (Table 1). Wetlands in the area are generally utilized in the aims of agriculture, cattle dealing, fishing and picking rush. There is no conservation status in this area except Hazar and Kuyucuk Lakes.

Wetlands of the East Anatolia Region that had been evaluated and it is conclude covers about 5% of these whole region's area. It could be stated that among the watersheds examined Van interior watershed included the widest wetland areas (53%), aras watersheed (26%), Fırat watersheed (18%) while Dicle watershed is in the least (3%) comparing with the number of wetlands included, it was also stated that 12 wetlands belong to aras watershed (37%), 11 wetlands belong to Van watersheed (33%), 7 belong to Fırat watersheed (24%) whereas 1 belong to Dicle watershed (6%).

Seventy-six percent of the wetlands in the study area are under no conservation scope. The city with the highest wetland numbers is Van (with 8 wetlands), followed by Mus (with 4 wetlands).

Wetlands on the East Anotolia Region route are less devastated compared to the others. It was stated that native people around the wetlands are generally occupied with agriculture, feeding animals, fishing and cutting rushes. Pollution sizes of the wetlands are not at the dangerous levels. Polluting sources are in the majority domestic wastes and industrial in the minority. However, the affects on the wetlands are increasing toward the south, because of the increase in the population and agricultural areas. Although the study area has a very rich bio-diversity, majority of the wetlands can not be conserved.

The areas where, the biodiversity has been lost, are the Rivers Dicle and Fırat and their surroundings. These areas include the many organisms rooted from mesopotamian aquatic communities and Middle East semi arid (semi dessert) regions. Most of these organisms are not seen in the other parts of Turkey. The fishes and the

birds, which need Dicle and Fırat River ecosystem to survive and the reptiles and the mammals, which adapted to the semi desserts are mostly endangered in the national scale. In the wetlands in the North Black Sea Region Mountains and even many other places in Turkey, the number of endangered species seems to be increasing (6).

It is crucial that ecological characteristics of wetlands biological, chemical and physical elements should be evaluated in the conservation aspect searching their interrelationships.

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