

## DISTRIBUTION OF AQUATIC ECOSYSTEMS IN AND AROUND ESKİŞEHİR

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### Abstract

There are 44 dams and ponds which are both artificial and naturally occurring within the borders of Eskişehir. In addition, there are 58 rivers in total. In addition to these, Balık Damı Wetland, which is a Natural Site which has occurred as a result of the floods of the Sakarya River, is also located.

These aquatic ecosystems are used as a resting area during migration as hosts to many species. It also hosts many endemic species. These endemic species include both invertebrate and vertebrate species.

For this reason, hunting is prohibited in the regions where endemic species are located and the researchers are subject to permission.

These aquatic ecosystems are also used for eco-tourism purposes.

This study contributes to Turkey's aquatic ecosystems; aquatic ecosystems better recognition of our country will be ensured.

**Key words:** Eskişehir, Wetland, Balık Damı, Endemic

**Note:** This study was presented as Oral in the 2nd International Water Congress.

## INTRODUCTION

There are 44 dams and ponds (Table 1), both artificial and natural, within the borders of Eskişehir. However, there are 58 streams (Table 2) in total, which are large and small [4].

In addition to these, Fish Dam Wetlands, which is a Natural Site and which occurred as a result of the floods of the Sakarya River, are also located [4, 5, 13, 14].

**Table 1.** Dam, Lake and Ponds in Eskişehir and its surroundings.

Porsuk Dam	Sivrihisar Okçu Dam	Beylik pond	Kayı III pond
Gökçekaya Dam	Mihalıççık Yarıklı Dam	Kelkaya pond	Sekiören pond
Sarıyar Dam	Mihalıççık Diközü Dam	Yukarı Soğut pond	Fethiye pond
Kunduzlar Dam	Sivrihisar Nasrettinhoça Dam	Aslanbeyli pond	Dağcı pond
Çatören Dam	Mihalıççık Bahtiyar Dam	Ömerköy pond	Çatnapınar pond
Kaymaz Dam	Beyazaltın (Sepetçi) Dam	Çukurhisar pond	Sazak pond
Musaözü Dam	Keskin (75.Yıl) Dam	Koçaş pond	Kızılcaören pond
Yenice Dam	Yukarı Kartal pond	Dereyalak pond	Özdenk pond
Han Üçyanı Dam	Karaozen pond	Yapıldak pond	Yayıklı (Koyun) Pond
İnönü Aşağı Kuzfındık Dam	Kanlıpınar pond	Ayvazlı I pond	Büyüköz pond
Beylikova Depolama Tesisi	Hanköy pond	Erenköy I pond	Dereköy Pond

**Table 2.** Rivers in and around Eskişehir

Ağsıkara Stream	Catalköy Stream	Göçüder Stream	Kargın Creek	Kuru Stream	Sarısu
Akayır Stream	Çatalözü Stream	Gök Stream	Keskin Stream	Mihalıççık Stream	Sarısu Creek
Akın Stream	Çıldırım Stream	Göllü Stream	Kırkınar Stream	Musaözü Stream	Seydi Creek
Alkınar Stream	Çiplaközü Stream	Hızır Stream	Kızıl Dere	Mattalıp Stream	Sulu Stream
Ankara Creek	Değirmen Stream	İlca Stream	Kızılcaören Stream	Okçu Stream	Sülüklüören Stream
Ayvacıolu Stream	Dinç Stream	İnönü Stream	Koca Dere	Porsuk Creek	Uçaklıören Stream
Bardakçı Stream	Elmalı Stream	Kalabalık Stream	Kocali Stream	Pirtek Stream	Yarıkkaya Stream
Çakıllı Stream	Fındıklı Stream	Karain Stream	Kulaksız Stream	Sakarya River	Yaylacı Stream
Çardaklı Stream	Gerziler Stream	Karamlık Stream	Kümbet Özü Stream	Sarıyay Stream	
Çatak Creek	Gevilli Stream	Karamlık Stream	Kunduzlu Stream	Sarıyay Stream	

Kuzfındık Dam, Musaözü Dam, Özdenk Pond, Kanlıpınar Pond, hunting is completely prohibited here [10].

### Important wetlands in the ecosystem

Within this ecosystem, we can list the important ones as follows.

- Balıkdamı Wetland
- Gökçekaya Dam,
- Porsuk River and Porsuk Dam,
- Musa Özü Pond and Nature Park,

#### a) Balıkdamı Wetland

Balıkdamı wetland is located in the borders of Sivrihisar district. It was formed by the merger of the Sakarya river

floods and Göksu tea. It covers an average of 1500 hectares. 2 of 4 of the Palearctic bird migration routes pass through Turkey. On the route of one of these two migration routes, there is the Balıkdamı Wetland [4, 5, 8, 9].

Therefore take place on one path last major migration of two birds out of Turkey because Balıkdamı, the status of a natural protected area National Parks, Game and is secured Culture and Conservation Council to protect the Natural Heritage and Wildlife [1, 4, 5, 8, 9]. This special system, which is very similar in the world, is called the "Water Basar Meadow system ecosystem. The importance of this system; to host more animals and to constitute more reproduction and sheltering [6].

Balıkdamı is the last stop in the west for wild water birds living in Asia and provides shelter, nutrition and breeding grounds for many species of indigenous, migratory and transit migratory birds [6, 8, 9, 13, 14]. This region also has a more temperate climate in Eskişehir, which has a continental climate in the Central Anatolia region.

Göksu tea together with large and small sources of fish feed.

One of these sources is the Balıkdamı sinkhole underground source, which is about 15 km away from the direction of Ahiler-Kurthis (Figure 1).

In the observation studies in the fish, an average of 250 different bird species were determined during the migration period of the birds. However, the number of storks in the migration period can reach up to 18,000. In addition to these, approximately 250 plant species were found to be distributed in fluorometric studies, 30 of which were endemic. It also hosts several different fish species, such as Yay, Kara broadcast, Israeli carp, Carp, Mirror Carp and more [1, 5, 6, 8, 9, 13, 14].



**Figure 1.** Balıkdamı sinkhole.

### b) Gökçekaya Dam

The Gökçekaya dam was built between 1967-1972. Belt height is 115 meters. When the total water volume is at the normal level, it has a water capacity of 910.000.000 m<sup>3</sup>. The maximum capacity is 953.000.000 m<sup>3</sup>. Turkey is the 17th largest hidroelektriksantral. It is located on the Sakarya River. It produces electricity to meet the daily electricity demand of 127,243 people (Figure 2) [5].



Figure 2. Gökçekaya Dam.

Besides all these numerical values; it also hosts many species. Invertebrate and vertebrate animal species and plant species constitute the dam ecosystem. Most of the invertebrates and vertebrates have been identified so far. For Eskişehir, there is a species of endemic freshwater shrimp, the *Palaemonates turcorum* Holthuis, 1961 and the Gastropoda species [11]. Fish, Silver, Carp, Mirror Carp and rare catchable catfish are available. In addition to these, it is also an important destination for migratory birds [1, 5, 14].

### c) Porsuk Dam

The Porsuk dam was built between 1966-1972. Dam; irrigation water supply, flood prevention, city water supply (domestic use and drinking) and industrial use. The height of the dam is 50 meters and the total area is 24 km<sup>2</sup>. Total water volume is 431.000.000 m<sup>3</sup> at normal level. About one year this volume is 206,000,000 m<sup>3</sup>, which is used as domestic mains water. It is located on Porsuk Stream (Figure 3) [5].



Figure 3. Porsuk Dam.

Porsuk reservoir is an important bird migration route. Muharrem Karakaya in 1999-2003 in the Master's thesis has been reported that 81 species were identified [7]. In addition; In addition to fish such as Carp, Silver and Publication, crayfish and crab species were also found in invertebrate groups.

It also hosts different invertebrate groups. The main

ones; Oligochaeta and Chironomidae species can be mentioned [2, 3, 12].

### d) Musaözü Pond and Nature Park

Musaözü Pond and its environs within the boundaries of Tepebaşı District of Eskişehir Province; It was designated as iştir Musaözü Nature Park Park on 11.07.2011 (Figure 4). Pond; crayfish, carp, and other fish species were also found in the fish [10].

In addition to this, bird species such as hawks and crows as well as wild boar and vertebrate species such as foxes and rabbits were observed.

In addition, common types of invertebrate species such as Chironomidae and Oligochaeta were also found [2, 3, 12].



Figure 4. Musa Özü Barajı.

## MATERIALS and METHODS

Literature studies were conducted to investigate the aquatic systems in Eskişehir and its surroundings. In addition, some information was obtained from the 3rd Regional Directorate of State Hydraulic Works. All dam lakes were examined in situ between 2015-2018.

## RESULT AND DISCUSSION

The aquatic ecosystems mentioned above and the other water systems in our list are used as the resting areas during the migration as well as many living species.

It also hosts many endemic species. These endemic species include invertebrates, vertebrates and plant species. Endemic species constitute the biological values of our country. For this reason, hunting is prohibited in the regions where endemic species are located and such studies are subject to permission.

These aquatic ecosystems are also used for eco-tourism purposes. Some of these are;

Diving activities are organized in Sakarbaşı, the region where the Sakarya river is born. In bird watching house located in Balıkdam, bird watching activities are performed in groups in the period of migration of birds. Fish catching races are organized in Musaözü Nature Park. In addition, canoeing and rowing races are also available in some water systems.

In addition to all of these, there are important factors that threaten the biodiversity of the aquatic ecosystem in Eskişehir and its environs.

At the beginning; drying works for uncontrolled opening of underground irrigation wells, agricultural area and residential areas. In addition, wastes from industrial enterprises in the environment, agricultural wastes in conditions not suitable by farmers and wastes of settlements are given to aquatic ecosystems, as well as other chemical pollution plays a major role. Many reasons can be listed such as the release of foreign fish species that threaten the fish species in the environment, uncontrolled cutting of reeds in

wetlands, incineration by different means, failure to comply with fish and birds' prohibition of hunting, wrong wetland policies.

The province of Eskişehir has both geographic and zoological importance. Due to its location, zoological cycles are an important zoological transition region. Therefore; The wetlands in the region have an important richness in terms of living diversity. Preservation of this biological richness will only be possible by conservation of wetlands.

#### REFERENCES

- [1]. 2004 Yılı, Eskişehir İl Çevre Durum Raporu, Eskişehir, 2005.
- [2]. Arslan N. 2000. The Naididae (Oligochaeta) fauna of Porsuk Stream, a part of the southern Sakarya River system. Book of Abstracts, VIII International Symposium on Aquatic Oligochaeta, Bilbao. 18-22 July, 27.
- [3]. Arslan, N., Öntürk, T., et.all. 2007. Diversity of Invertebrate Fauna in Littoral of Shallow Musaözü Dam Lake in Comparison with Environmental Parameters. Journal of Applied Biological Sciences, 67-75.
- [4]. Demirsoy A. 1999. Genel ve Türkiye Zoocoğrafyası, I. Baskı, Metaksan A.Ş. Ankara.
- [5]. DSİ Genel Müdürlüğü, Eskişehir Bölge müdürlüğü verileri. Haziran, 2018.
- [6]. Eken, G. Bozdoğan, M. İsfendiyaroğlu, S. Kılıç, D.T. Lise, Y. (Edt) 2006. Türkiye' nin Önemli Doğa Alanları. Doğa Derneği, Ankara.
- [7]. Karakaya, M., 2003. Eskişehir-Porsuk baraj gölü Ornitofaunası üzerine çalışmalar. Eskişehir Osmangazi Üniversitesi, Fen Bilimleri Enstitüsü, Yüksek lisans tezi.
- [8]. KIZIROĞLU, İ. 2008. Red Data Book.
- [9]. KIZIROĞLU, İ. 2009. "Türkiye Kuşları".
- [10]. Orman ve Su işleri Bakanlığı, Eskişehir Orman Bölge Müdürlüğü verileri. 2018.
- [11]. Öntürk, T., 2009. Palaemonetes turcorum Holthuis, 1961 (Palaemonidae, Decapoda)'un larval gelişiminin incelenmesi. Eskişehir Osmangazi Üniversitesi, Fen Bilimleri Enstitüsü, Doktora tezi.
- [12]. Polatdemir N, Şahin Y. 1997. Eskişehir ve çevresi durgun su sistemleri Chironomidae (Diptera) larvaları, Turkish Journal of Zoology. 21(3): 315-319.
- [13]. Yarar, M. ve Magnin, G. 1997. Türkiye'nin Önemli Kuş Alanları. DHKD, İstanbul.
- [14]. Zeytinoğlu, M. Kılıç, A.Y. ve Zeytinoğlu, H. 1994. Kaybolan Değerlerimizden Balıkdanı. Ege Üniversitesi. Fen Fakültesi Dergisi Seri B. Cilt: 16/1.