



Ponderful
PONDS FOR CLIMATE

TÜRKIYE 

PONDSCAPE : LAKE MOGAN PONDSCAPE



Pond Ecosystems for Resilient Future Landscapes in a Changing Climate

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No ID 869296

WHAT IS A PONDSCAPE ?

DEFINITION

A pondscape is a network of ponds with spatial proximity (“connectedness”) and the surrounding landscape matrix.

The boundaries of a pondscape may be determined by physical or ecological settings (a valley, a catchment, a set of ponds in a nature reserve) or even determined by societal or political criteria (urban ponds, provincial or national boundaries).

PRESSURE/THREATS ON PONDS AND PONDSCAPES

50-90% of pond losses in European countries over the past century. Furthermore, ponds are largely neglected in water- and nature-related national and EU policies and strategies, including the EU-WFD.

WHY IS IT IMPORTANT TO PROMOTE THEM ?



BIODIVERSITY ENHANCEMENT

Largely neglected and generally undervalued, ponds are remarkably important for biodiversity conservation. Pondscapes represent biodiversity hotspots.



DISASTER RISK REDUCTION

Ponds and pondscapes play a fundamental role in mitigating flooding and also constitute a water reserve to fight fires.



HUMAN HEALTH

Ponds and pondscapes provide a wide range of co-benefits for human societies such as support for human health and quality of life, spaces for physical activities, or social interaction, but also aesthetic experiences and educational and recreational activities.



CLIMATE CHANGE MITIGATION AND ADAPTATION

Given their abundance and their high productivity, ponds influence markedly the carbon cycle by acting as both carbon sinks and sources.



WATER MANAGEMENT

Pondscapes provide a water reserve that is particularly important in the context of water scarcity. It is particularly useful for watering animals and for irrigation.

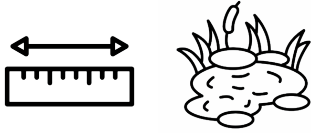
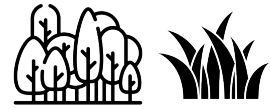
CONTEXT

Along the western and southern shores of Lake Mogan there are several lake littoral ponds called Lake Mogan pondscape that were formed by a drop in water level. This is the most upstream pondscape . Lake Mogan and the ponds are fed by the water carried from the Çökek Wetland and streams from the south and the west, which are densely covered with reedbeds. In addition to their great importance in protecting water quality, reedbeds are also ideal for sheltering and as a breeding areas for many animal species, especially water birds. Together with Lake Mogan, this pondscape is under the legislation of Special Environmental Protection Area (SEPA), and was declared an "Important Bird Breeding & Shelter Area". The west ponds are called Dikkuyruk ponds, named after the endangered white-headed duck (*Oxyura leucocephala*) that breeds and shelters there. They are managed by the Gölbaşı District Municipality.



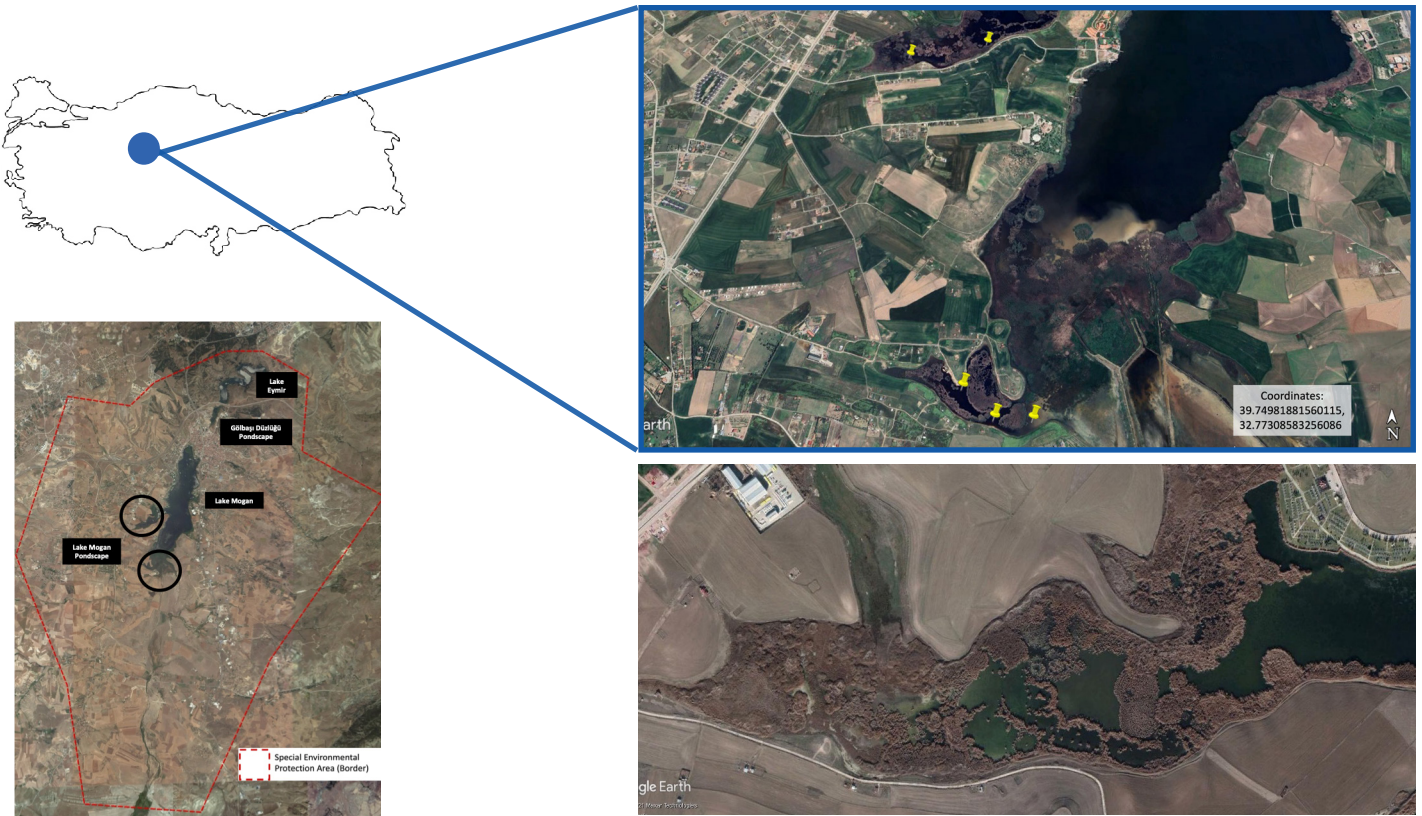
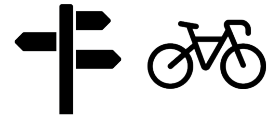
Name of the pondscape : Lake Mogan, Dikkuyruk, ponds
Name of neighboring large town (in a 30 km radius):
Bala, Haymana, Mamak, Çankaya and Gölbaşı (1.826.672 habitants)
Bioclimatic zone : Central-Anatolian cold arid steppe climate

Dominant land use :
Pondscape - nature reserve
Surrounding environment - urban



Pondscape area : 1.83 km²
Pond : number: ~ 15 - 20 (Sampled Pond Number: 5)
density: 2.73/km²
surface areas : 1'140 to 44'300 m²
depths : 26 to 130 cm
ages : NA

Water owner : Treasury of the Republic of Türkiye (Public ownership)
Land owner : Diverse private owners
Land manager : District Municipality of Gölbaşı
Public access : 100 % of the area is accessible
Public amenities : several foot paths, bycycle roads

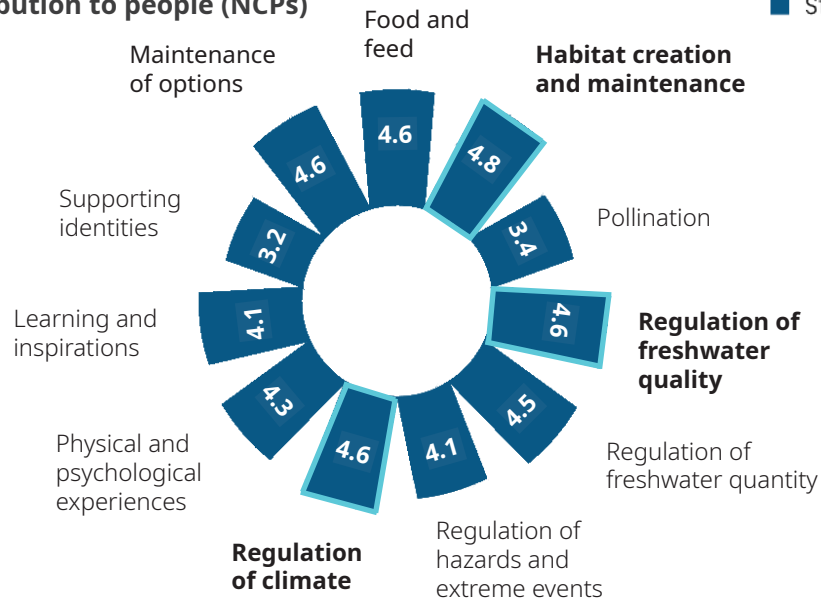


LOCAL COMMUNITY EXPECTATIONS

The 11 Nature-contribution to people (NCPs)

Scale : scores from 1 to 5

■ Stakeholders (n=8)



The stakeholder expectations rely mainly on (i) habitat creation and maintenance, (ii) freshwater quality, (iii) regulation of climate, (iv) food and feed (ie., winterwheat production in the greater area), (v) maintenance of options and (vi) regulation of freshwater quantity.

LOCAL POLICIES

Along the western and southern shores of Lake Mogan there are several Lake littoral ponds called Lake Mogan pondscape that were formed because of a decrease in water level. This is the most upstream pondscape and it is part of the Gölbaşı Special Environmental Protection Area (Gölbaşı SEPA), which was established in 1992 to curb the urbanisation of the peri-urban area of Ankara and protect its high biodiversity value. The area is also one of the 184 designated «Important Bird Areas» and has been declared an «Important Bird Breeding and Shelter Area». In addition, Lake Mogan pondscape and the lake is one of the 122 Important Plant Areas (IPA) in Türkiye. SEPA requires protection and conservation of the ecological characteristics of the area.

The recent management plan for SEPA specifically prioritises the protection of waterbird nesting sites and accordingly, during the breeding period of birds from March 15th to July 15th, no activities other than monitoring, research, and protection activities can be carried out in the area. It is forbidden to engage in fishing of any kind during that time. It is important to note that any activities that may disrupt the water regime or result in drying out of waterbodies are strictly prohibited. The Gölbaşı SEPA Management Plan (2015-2019) was made as part of the «Determining Sensitive Areas and Water Quality Targets on Basins». The region is divided into two areas: Sensitive A and Sensitive B. The Sensitive A area includes Lake Mogan pondscape, Çökek Wetland (which is the major water source to Lake Mogan and the ponds), reed areas of Gölbaşı Plain, and the habitat of the endemic plant *Centaurea tchihatcheffii*. According to the management plan, Sensitive A areas must be protected at any cost.

The effective implementation of either SEPA's management plan is challenging. Initially, the introduction of SEPA helped to reduce the construction of hotels along the shore of Lake Mogan, and existing tourism facilities were removed. However, in the catchment of the lake and near the ponds, there is currently a major real-estate development (especially small bungalow-type houses with gardens), low-intensity agriculture (winter wheat cultivation), and recreational areas (restaurants and cafes). Establishing recreational areas near ponds increases pedestrian traffic, negatively impacting habitat quality for plants and waterbird. Studies have shown that an increase in pedestrian traffic led to a decline in the habitats of the endemic plant species *Centaurea tchihatcheffii* and a reduction in the population density of waterbird species in the area.

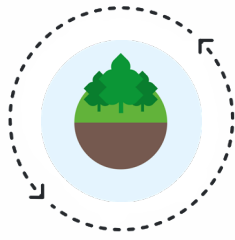
-100% of the pondscape is protected by SEPA, Special Environment Protection Area, which aims to protect sensitive areas and their surroundings, both above and underwater.

- Important bird breeding, feeding & shelter area of National Importance: 7 species of herons observed in Türkiye utilise the area for breeding, wintering, or during migration.

-Lake Mogan pondscape and the lake is one of 122 Important Plant Areas (IPA) in Türkiye.

100%
7
122

MAIN CHALLENGES AND OBJECTIVES



BIODIVERSITY ENHANCEMENT

Especially waterbirds, amphibians, and aquatic plants.



HUMAN HEALTH

An urban blue-green space for walking, socialising, relaxing, and educating people about nature.



NATURE BASED SOLUTIONS (NBS)

Pondscape scale land use and management actions are the Nature-based Solutions put in practice to address the four identified societal challenges.

1990

The implementation of a large protected area (Gölbaşı SEPA)

1992

Preparation of an Environmental Plan at a scale of 1:25,000

2015

Gölbaşı SEPA Management Plan (2015 – 2019)

PONDS AND PONDSCAPE MANAGEMENT

- Protection Status given to a large area (Gölbaşı SEPA) due to high ecologic value of the Lakes Mogan and Eymir, reeds and the ponds.
- Prohibition of the construction of closed areas, excavation and filling.
- Declaration of "Sensitive A" zone for Lake Mogan pondscape (Absolute protection of reeds and ponds).
- Declaration of "Important Bird Breeding & Shelter Area" for Lake Mogan Pondscape.
- Changes in the zoning plan to reduce the density of construction and expropriation of private lands within Sensitive A.
- Prohibition of fishing (SEPA).
- Removal of existing tourism facilities that were previously in place.
- Cleaning of fish nets and solid waste, especially to protect White-headed Duck (*Oxyura leucocephala*).
- Regular monitoring and recording of bird species breeding in the SEPA area (Especially Ferruginous Duck (*Aythya nyroca*) and White-headed Duck (*Oxyura leucocephala*)).
- Closing breeding areas to human activities during the breeding period (except for monitoring, research, and protection activities).
- Regularly monitoring of the species *Centaurea tchihatcheffii*, protecting densely populated areas, and fencing them based on property status.



- Assessing the potential for water-based recreational activities while maintaining a balance between conservation and usage.
- Determination of landscape viewing and bird observation points.
- Collection of solid waste from daily use areas.

NATURE CONTRIBUTIONS TO PEOPLE AND MEASURED INDICATORS



AQUATIC BIODIVERSITY

SPECIES RICHNESS

Aquatic plants (SEPA Area, including Gölbaşı Düzlüğü and Lake Eymir) : **51**

Waterbirds (Observed in the pondscape) : **83**

Waterbirds (SEPA Area, including Gölbaşı Düzlüğü and Lake Eymir) : **249**

Dragonflies (Genus) (SEPA Area, including Gölbaşı Düzlüğü and Lake Eymir) : **13**

Families of invertebrates (SEPA Area, including Gölbaşı Düzlüğü and Lake Eymir): **17**

AMOUNT OF

Species in Global IUCN (2022) Red List (Categories CR, EN, VU, NT) (Lake Mogan and the environment): **5** (*Centaurea tchihatcheffii* (CR), *Oxyura leucocephala* (EN), *Branta ruficollis* (VU), *Aythya nyroca* (NT), *Marmaronetta angustirostris* (NT))

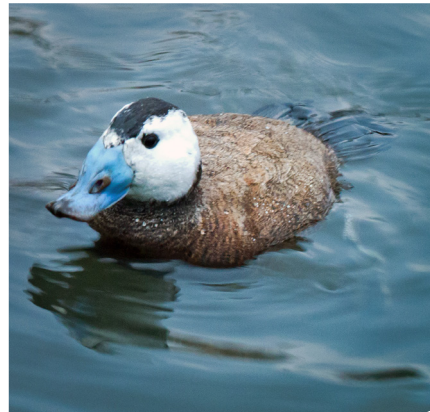
Conservation priority species for Türkiye (Rare and endangered) (Lake Mogan and the environment): **9** (*Centaurea tchihatcheffii* (CR), *Oxyura leucocephala* (EN), *Branta ruficollis* (VU), *Aythya nyroca* (NT), *Marmaronetta angustirostris* (NT), *Chroicocephalus genei* (LC), *Microcarbo pygmaeus* (LC), *Botaurus stellaris* (LC), *Ixobrychus minutus* (LC))

Invasive alien species (N): **1**

FLAGSHIP SPECIES :



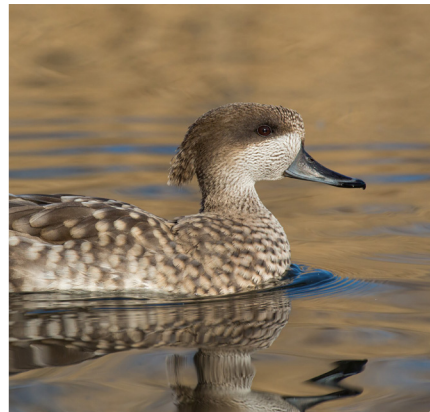
Centaurea tchihatcheffii (CR)



Oxyura leucocephala (EN)



Pelophylax ridibundus



Marmaronetta angustirostris (NT)

NATURE CONTRIBUTIONS TO PEOPLE AND MEASURED INDICATORS



PHYSICAL AND PSYCHOLOGICAL EXPERIENCE

Number of people visiting the pondscape (leisure, tourism, fishing, nature watching etc.) (nb/year)

7'500-18'000

100%

Area inside the pondscape accessible to the public

Self-reported satisfaction well-being (scale 1 to 5)

3.8

Most popular activities :

wildlife observation (22%), landscape aesthetics (21%), possibility to practice a desired activity (18%)



LEARNING AND INSPIRATION

2

Number of groups of people visiting the pondscape, especially for bird watching (nb/year).



WATER QUALITY

3

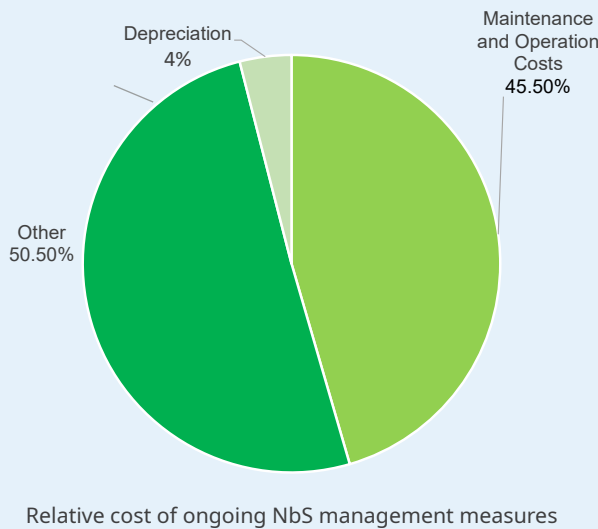
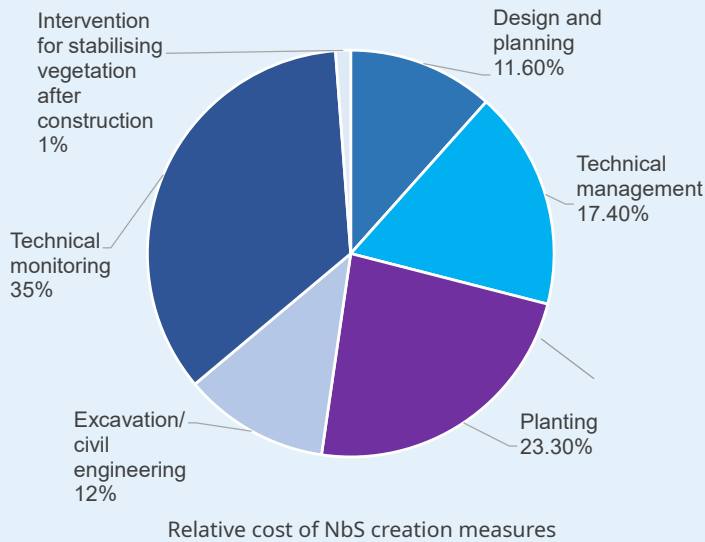
Generally, the water is clear but there is garbage and litter around and inside water in some of the ponds (scale 1 to 5).

COSTS AND BENEFITS ANALYSIS

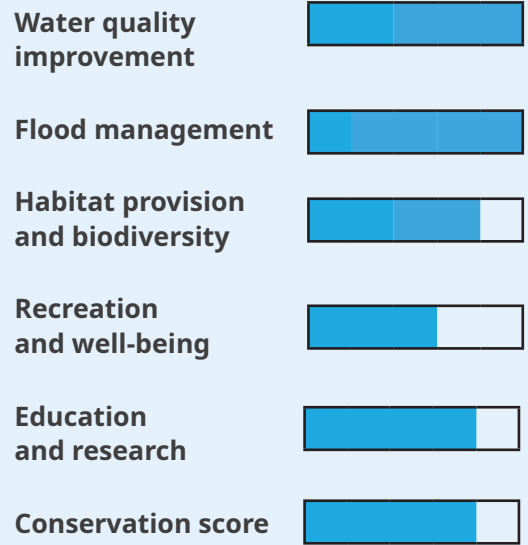
OVERALL COSTS ASSESSMENT



SHARE OF COSTS FOR NBS ACTION



BENEFITS ASSESSMENT



SUITABLE FINANCE INSTRUMENTS TO REDUCE THE GAP

- ✓ **1. Income instruments**
Development Rights and Leases
- ✓ **2. Voluntary contributions /donations**
Philanthropic contributions, Voluntary beneficiary contributions, Crowdfunding
- ✓ **3. Grants**

FUNDING GAP ASSESSMENT



REMAINING THREATS

Increasing real estate development, pedestrian and car traffic, water abstraction, and reed cutting, sediment removal, and improper waste disposal threaten Lake Mogan and the pondscape. In addition, housing construction in the southern and western sides of the lake and the ponds also poses a threat.

It appears that there may be some challenges in the area with the effective implementation of SEPA (see Local Policies section). There may be room for improvement regarding coordination between the organisations responsible for managing the lake and ponds, and SEPA. There is also need for ongoing efforts to balance conservation goals with recreational activities, while ensuring effective coordination among the pondscape stakeholders area so that it becomes a good example of NBS.

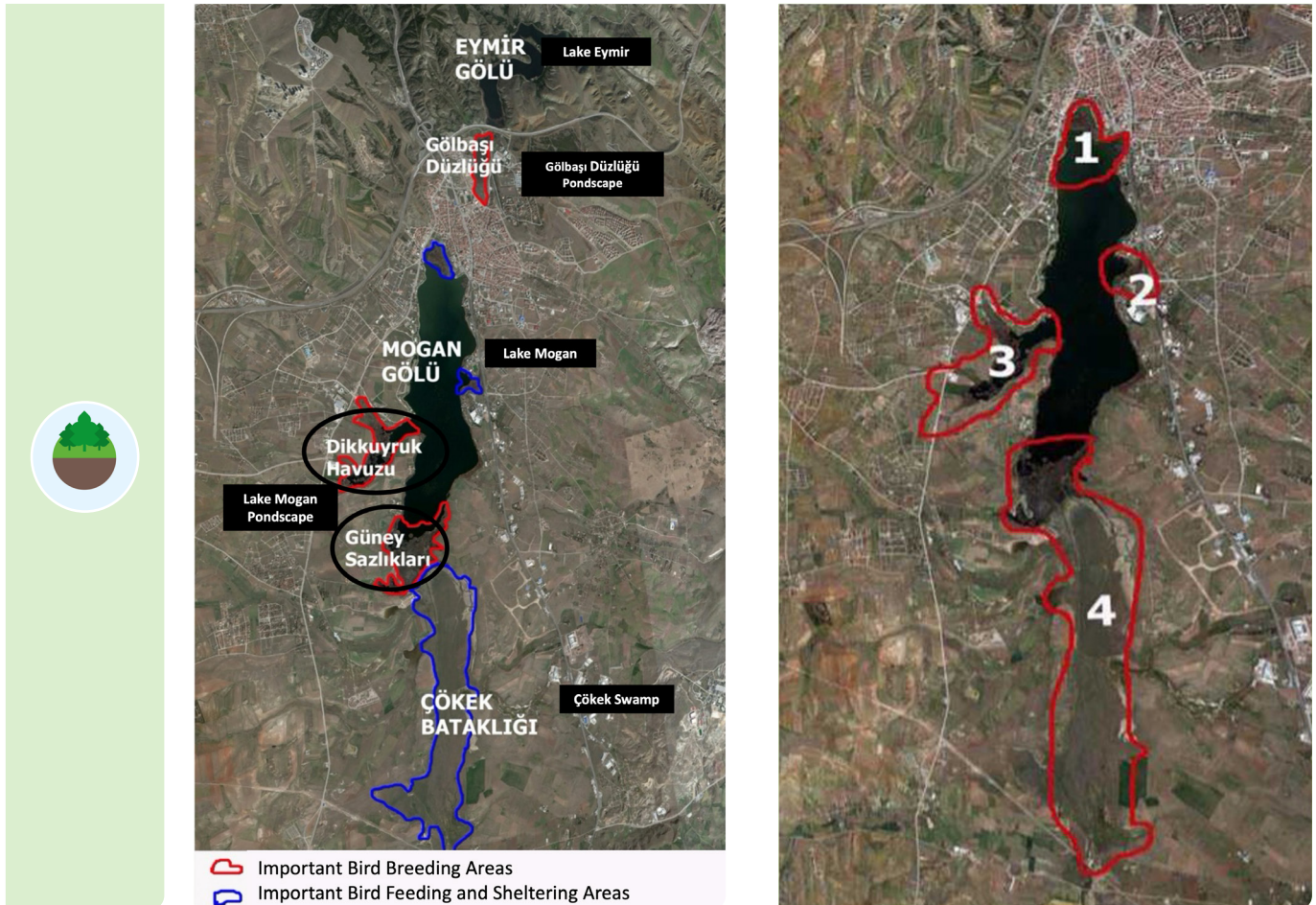
The ponds should be restored according to the CLIMA ponds principles, for which biodiversity enhancement is the primary focus but climate as well as society-related benefits are also considered.

SUCCESS STORY AND TRANSFERABILITY

LAKE LITTORAL PONDS PROVIDE AN INVALUABLE HABITAT FOR WATERBIRD COMMUNITIES AND OTHER SPECIES

Lakes Mogan and Eymir and the ponds (both Lake Mogan pondscape and Gölbaşı Düzlüğü) are home for thousands of birds of different species that feed, breed and shelter there. Lake Mogan is one of the 184 important bird areas (IBAs) in Türkiye. Around 249 bird species have been identified in the SEPA region. The lake, and especially the lake littoral ponds to the West and South of the lake, gained status as an important bird area (see Figure 16) with Squacco Heron (*Ardeola ralloides*) (30 pairs), Red-crested Pochard (*Netta Rufina*), (50 pairs), Ferruginous Duck (*Aythya nyroca*) (10 pairs) and White-headed Duck (*Oxyura leucocephala* (2 breeding pairs). Among the species breeding in the area, White-headed Duck (*Oxyura leucocephala*) is globally endangered (EN) and the Ferruginous Duck (*Aythya nyroca*) is near-threatened (NT) species, according to IUCN categories.

The recent studies carried out on the birds of the SEPA area located four important regions for water birds, which can be seen in the figure below (Figure 17). Of these, areas number 1 (North of Lake Mogan) and 2 (east of Lake Mogan) have lost their importance to a great extent due to the construction of pedestrian walkways heavily used by pedestrians, and vehicle traffic around them. Number 3 and 4 are the Ponds in the Lake Mogan Pondscape and they are still important for birds for nesting, breeding and feeding. Ponds located in the western littoral zone of Lake Mogan is the most important breeding site for White-headed duck (*Oxyura leucocephala*), Great Bittern (*Botaurus stellaris*), Little Bittern (*Ixobrychus minutus*), Squacco Heron (*Ardeola ralloides*), Ferruginous Duck (*Aythya nyroca*), Red-crested Pochard (*Netta rufina*). Ponds located in the Southern littoral of Lake Mogan are also important bird breeding area for the same species and the relatively low human activity in these ponds provide a safer environment. Common Pochard (*Aythya ferina*), Ruddy Shelduck (*Tadorna feruginea*) and Mallard (*Anas platyrhynchos*) are the duck species that are also commonly breed in the pondscape. Northern Pintail (*Anas acuta*), Northern Shoveler (*Spatula clypeata*), Green-winged Teal (*Anas crecca*), Gadwall (*Mareca strepera*), Eurasian Wigeon (*Mareca penelope*), Garganey (*Spatula querquedula*) and Tufted Duck (*Aythya fuligula*) are duck species that spend their migration and winter periods in the area.

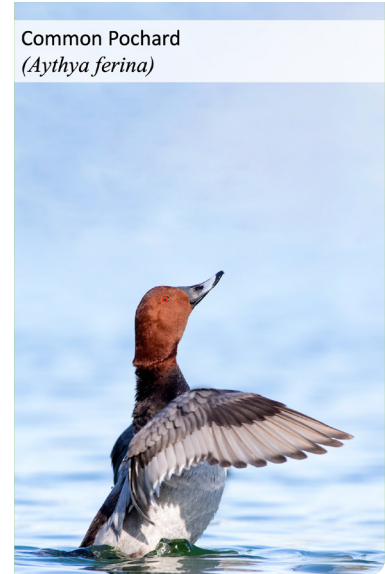
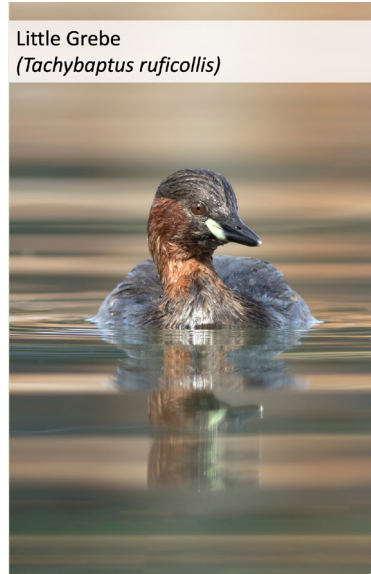


LAKE LITTORAL PONDS PROVIDE AN INVALUABLE HABITAT FOR WATERBIRD COMMUNITIES AND OTHER SPECIES

All seven heron species in Türkiye have been observed in Lake Mogan during breeding, wintering or migration periods. Of these, the Squacco Heron (*Ardeola ralloides*) and the Black-crowned Night Heron (*Nycticorax nycticorax*) stay in the reeds and use the area as feeding and shelter. The Great Egret (*Egretta alba*), the Little Egret (*Egretta garzetta*), the Gray Heron (*Ardea cinerea*), the Purple Heron (*Ardea purpurea*) and the Western Cattle Egret (*Bubulcus ibis*) spend their winter and migration period in Lake Mogan and in ponds.

Of the shorebirds, the Northern Lapwing (*Vanellus vanellus*) (NT) and the Black-winged Stilt (*Himantopus himantopus*) are important species that breed in the Lake Mogan ponds. In addition to these, 30 species of coastal and seabirds use the area, especially the Common Ringed Plover (*Charadrius hiaticula*), Little Ringed Plover (*Charadrius dubius*), the Little Stint (*Calidris minuta*), Spotted Redshank (*Tringa erythropus*) and the Black-headed Gull (*Chroicocephalus ridibundus*). In addition, in late autumn and before spring, Red-crested Pochard (*Netta rufina*) (max. 673), Ferruginous Duck (*Aythya nyroca*) (max. 200) and Eurasian Coot (*Fulica Atra*) form large groups in the lake. In past counts, there have been years when more birds than 70,000 (max. 78,590) were counted in autumn in the general SEPA region.

A recent study was carried out in the pondscape to monitor the breeding population of the White-headed ducks, supported by the Nature Association (NGO), Simurg Bird Nest Association (NGO), French Embassy and the French Cultural Center in Türkiye. According to their observations, 46 and 33 White-headed Ducks were sighted in two consequent observations. Many other duck species, such as Red-crested Pochard, Northern Pintail, Common Pochard, Northern Shoveler and Eurasian Wigeon were also observed in the pondscape during the same study.



Another study was carried out to identify plant and animal species in the catchment and also to track and safeguard delicate habitats for endangered endemic plant species *Centaurea tchihatcheffii*, which is listed as «Critically Endangered» (CR) (Figure 19) according to the IUCN criteria (Figure 20). A total of 494 plant species were identified. Additionally, 3 species of amphibians, 12 species of reptiles, and 25 species of mammals were identified within the SEPA.



IMPORTANCE OF INCREASING INTER-INSTITUTIONAL COORDINATION: EXAMPLE OF THE ENDEMIC SPECIES SEVGI ÇİÇEĞİ NATIONAL GARDEN

Sevgi Çiçeği National Garden was planned to be built in a catchment close to the Lake Mogan pondscape and at a distance that could affect both the endangered *Oxyura leucocephala* and other species in the ponds. Through negotiations, the National Garden has been re-located to a place further away from the pondscape. Through this, the negative impact of the proposal for the wildlife of the ponds have been limited. This is an example of good practice owing to increased coordination between academic, NGO and practitioners.





HANDBOOK :



APPENDIX :



PHOTOS CREDITS

Maps of : *Special Environmental Protection Area and the Lake Mogan Pondscape*, p.2, *Important Bird Breeding, Feeding and Sheltering Areas in Gölbaşı Sepa*, p. 8 *The distribution of Centaurea tchihatcheffii*, p.9 © SEPA Environmental Layout Plan (2022)
Centaurea tchihatcheffii, *Oxyura leucocephala*, *Pelophylax ridibundus*, *Marmaronetta angustirostris* p. 9 © Wikipedia
Collage of photos of some of the important species in Gölbaşı Düzlüğü Pondscape © Greater Ankara Municipality

AUTHORS

Başoğlu Acet D., Avcı F., Kıran H., Akpınar M. B., Dolcerocca A., Akyürek Z., Beklioğlu M.

2024