

# Ecological Groups of Birds of Greater Shor Lake of the Azerbaijan Republic

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## Abstract

By studying the composition and distribution of various species of birds in space, which present specialized requirements for the habitat, one can judge the well-being and balance of processes in local and regional ecosystems. It should be noted that our republic, including the Absheron peninsula, is located on the flight path of birds from the Volga-Ural basin, Western Siberia and Kazakhstan to North-East Africa to the area of the "African horn" and around it. This path is also called the "Caspian Flyway". Greater Shor Lake is located on the Absheron Peninsula of the Republic of Azerbaijan. The basis of the material was the observations we conducted from 2015 to 2019 on Greater Shor Lake and surrounding areas. The determination of birds was carried out according to the training manual "Methods for Evaluating Wetland Condition: Biological Assessment Methods for Birds". During our work in the autumn-winter periods, both sedentary and migratory bird species were recorded on the lake, their species composition was determined. For migrant birds, the following stay statuses were noted: wintering, nesting, nesting — wintering, migratory. 17 orders of birds live in our republic, of which species belonging to 8 orders are registered on the lake Boyuk Shor. Species included in the Red Book of the Republic (Mute swan (*Cygnus olor*)) and the IUCN Red Book (European honey buzzard (*Pernis apivorus*)) are registered on the lake.

## Keywords

Greater Shor Lake, Taxonomic Composition, Nature of Stay, Bird Attendance by Years, Migration

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## 1. Introduction

Absheron is rich in lakes "which play an important role in the ecology of the environment. By humidifying the air, they soften the influence of dust storms which Absheron is famous for, and the summer heat, lowering the air temperature. In the recent past, Absheron lakes were of great economic importance, they were a source of food for the population, but alas, now some of them are slowly dying.

The condition of many lakes, unfavorable both for the environment and for animals, either living here since ancient times (settled), or those visiting these places during

migrations, causes grief [1, 2].

It should be noted that the project to clean the Greater Shor lake is carried out in accordance with the decree of the President of the Republic of January 17, 2014 on the approval of the "State program of social and economic development of Baku and its villages in 2014-2016" and the decree "Additional measures in the field of improving the environmental situation, the protection and use of Lake Greater Shor" [3].

By decree of the President of the republic, restoration work

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began on Greater Shor Lake. Currently, the lake is separated from the highway by about half a kilometer, returning to its former shores. Restored part of the lake with an area of approximately 300 hectares. Specialists came to the conclusion that Absheron lakes should be declared “natural monuments”, since such monuments are protected by the legislation of the country [4].

Also, the Netherlands company developed a feasibility study (TEO), according to which this grandiose event to restore the nine lakes of Absheron, including Greater Shor, will cost an average of 456.800 million manat. And then our lakes will delight both the diversity of birds and all life in them.

It should be noted that through Azerbaijan, including Absheron, one of the most powerful bird flyways in Eurasia from Eastern Europe and Western Siberia to the South - to East and South-West Africa and vice versa, which makes it even more necessary to protect the visitors ponds from pollution and extinction [5-9].

## 2. Material and Methodology

The basis of the material was the observations we conducted from 2015 to 2019. on Greater Shor Lake and surrounding areas. The determination of birds was carried out according to the training manual “Methods for Evaluating Wetland Condition: Biological Assessment Methods for Birds” [10].

*Equipment's:* Binocular (8×42, 10×42), Spotting scope (25x, 60x), Photo camera (Panasonic Lumix FZ82 / 60× zoom)

*Methods:*

The following recommendations that we have used in our studies are based partly on accepted bird survey protocols from nonwetland habitats, for example, Ralph *et al.* [11, 12], Bibby *et al.* [9], as well as some techniques applied specifically to wetlands (Ribic *et al.* [13], Weller [14]).

Based on these methods birds in wetlands are best inventoried using area searches or point counts. Area searches (also called “direct counts,” Weller [15]) are appropriate for the parts of wetlands where visibility is unobstructed, such as open water areas, mudflats, and short-grass flats. Species are counted based on visual, not auditory, identification.

Area searches involve using a spotting scope or binoculars to scan the open area from one or more fixed points, generally viewpoints with the best visibility of the site and whose fields of vision do not overlap. Occasionally, area searches will involve canvassing an area by boat, aircraft, or by walking. Area counts are intended to survey only the most visible waterbirds (e.g., ducks, herons, shorebirds. Birds should be identified and counted until all individuals within the field of

view have been tallied. To facilitate later data interpretation, the search area (and associated data collection) may be subdivided into individual habitat types. Area searches may be used in wetlands of any size wherever views are unobstructed.

Point counts can include all habitats within a site and are especially appropriate where visibility is partly obstructed by trees, shrubs, and / or tall grasses. Species that are seen or heard are counted.

Point counts also involve tallying birds from fixed points, but require the observer to identify all species by sound as well as sight. Usually, no two points should be closer than 200 m to each other [11]. Thus the number of points allocated to any wetland will depend on wetland size.

## 3. Analysis and Discussion

As noted, Greater Shor Lake is one of the largest salt lakes of Absheron located in the Binagadi, Sabunchu and Narimanov districts of Baku. The origin is relict. The area is 14.2 km<sup>2</sup>, the volume is -27.5 km<sup>2</sup>, the height above sea level is -12.6 m, the depth is -0.5 -4 m [16]. Even 100 years ago, the area of this lake was 10 sq. km with a depth of one meter [17]. The increase in the size of the lake to the above figures occurred as a result of the discharge of waste water [18].

In 1866, the first oil storage tank in Azerbaijan was built near the lake. In 1929, oilfield waters flowed into the lake along the Keshla Canal, and starting from the 1970s, household, domestic and industrial waters were thrown into the lake [1]. According to international experts, Greater Shor Lake is considered one of the most polluted lakes in the world.

The lake also had balneological significance, however, as a result of the fact that the first meter of bottom sediment was so saturated with fuel oil that it lost its medicative properties. The reeds on the shore of the lake, where birds usually hid from predators or nested, are also saturated with fuel oil.

Since time immemorial, salt has been mined on Lake Greater Shor. In some years, they mined up to 30 thousand tons per year, but since 1956 production has been stopped due to severe pollution by oil industry waste.

However, despite this gloomy characteristic, the lake attracts many species of birds [19]. Center of the lake is deep. This fact, as well as excessively dirty water, push most species to the coastal zone, as well as to small "lakes" adjacent to the lake.

Environmental monitoring carried out in the autumn and winter periods made it possible to determine the taxonomic composition, the nature of the stay on the lake, the identification of ecological groups and the frequency of visits

to the lake by various bird species by year [20]. It should be noted that about 69 species of representatives of phyto- and zooplankton and benthic organisms have been identified in the lake [21-24].

On the lake, we have noted many species of wintering, nesting, migratory and resident species of birds (Table 1).

**Table 1.** Taxonomic composition and stay status of birds recorded on Greater Shor Lake.

Cluster	Family	Species	Stay status
<i>Podicipediformes</i>	<i>Podicipedidae</i>	<i>Podiceps nigricollis</i>	Sedentary
<i>Pelecaniformes</i>	<i>Phalacrocoracidae</i>	<i>Phalacrocorax carbo</i>	Sedentary
<i>Ciconiiformes</i>	<i>Ardeidae</i>	<i>Ardea alba</i>	Wintering
<i>Anseriformes</i>	<i>Anatidae</i>	<i>Cygnus olor</i>	Wintering, sometimes in nesting
«-«	«-«	<i>Anas crecca</i>	Wintering and flying
		<i>Anas clypeata</i>	Wintering
		<i>Aythya fuligula</i>	Wintering
		<i>Aythya farina</i>	Wintering
<i>Falconiformes</i>	<i>Accipitridae</i>	<i>Pernis apivorus</i>	Flying-nesting
«-«	«-«	<i>Circus aeruginosus</i>	Sedentary
«-«	«-«	<i>Falco tinnunculus</i>	Nesting-partly wintering
<i>Gruiformes</i>	<i>Rallidae</i>	<i>Rallus aquaticus</i>	Partly wintering
«-«	«-«	<i>Gallinula chloropus</i>	Sedentary
«-«	«-«	<i>Fulica atra</i>	Sedentary
<i>Charadriiformes</i>	<i>Charadriidae</i>	<i>Pluvialis squatarola</i>	Flying
«-«	<i>Recurvirostridae</i>	<i>Himantopus himantopus</i>	Flying-nesting
«-«	<i>Scolopacidae</i>	<i>Gallinago gallinago</i>	Wintering, sometimes in nesting
«-«	«-«	<i>Tringa stagnates</i>	Flying, partially on wintering
«-«	«-«	<i>Tringa glareola</i>	Nesting, partly wintering
«-«	«-«	<i>Arenaria interpres</i>	Rare and Irregular migrating
«-«	«-«	<i>Calidris temincki</i>	Wintering and flying
«-«	«-«	<i>Phylomachus pugnax</i>	Flying
«-«	<i>Lariidae</i>	<i>Larus cachinnans</i>	Nesting, partly wintering
«-«	«-«	<i>Larus ridibundus</i>	Flying
<i>Passeriformes</i>	<i>Alaudidae</i>	<i>Galerida cristata</i>	Sedentary
«-«	<i>Motacillidae</i>	<i>Anthus campestris</i>	Flying
«-«	«-«	<i>Motacilla alba</i>	Flying and partly nesting
«-«	<i>Prunellidae</i>	<i>Prunella modularis</i>	Wintering
«-«	<i>Turdidae</i>	<i>Luscinia svecica</i>	Flying
«-«	«-«	<i>Saxicola rubetra</i>	Nesting
«-«	«-«	<i>Oenanthe oenanthe</i>	Nesting
«-«	<i>Paridae</i>	<i>Panurus biarmicus</i>	Sedentary
«-«	«-«	<i>Remiz pendulinus</i>	Sedentary
«-«	<i>Corvidae</i>	<i>Corvus frugilegus</i>	Sedentary
«-«	<i>Sturnidae</i>	<i>Sturnis vulgaris</i>	Sedentary
«-«	<i>Emberizidae</i>	<i>Emberiza hortulana</i>	Nesting
«-«	«-«	<i>Emberiza schoeniclus</i>	Wintering
«-«	<i>Fringillidae</i>	<i>Fringilla coelebs</i>	Sedentary
«-«	«-«	<i>Carduelis carduelis</i>	Sedentary
«-«	<i>Passeridae</i>	<i>Passer domesticus</i>	Sedentary
«-«	«-«	<i>Passer montanus</i>	Sedentary
«-«	«-«	<i>Passer hispaniolensis</i>	Sedentary

The variety is distinguished by the cluster *Passeriformes* -18 species, *Charadriiformes* belong to 7 species, falconous and crane-like (*Falconiformes*, *Gruiformes*) are represented by 3 species, 5 species of waterfowl (*Anseriformes*), 2 species of

*Podicipediformes*, and 1 species of *Pelecaniformes* and *Ciconiiformes*.

Below we present photograph of birds taken by us on the

Greater Shor Lake (Figure 1):



**Figure 1.** Mute swan (*Cygnus olor*).

An analysis of bird species attendance by year (2015-2019) showed that in all the noted years there were: small grebe (*Podiceps ruficollis*), Eurasian green-winged teal (*Anas crecca*), mallard (*Anas platyrhynchos*), Northern shoveler (*Anas clypeata*), and Western marsh harrier (*Circus aeruginosus*), common moorhen (*Gallinula chloropus*), Eurasian coot (*Fulica atra*), silver gull (*Larus cachinnas*), lake gull (*Larus ridibundus*), crested and field lark (*Galerida cristatus*, *Alauda arvensis*) rook (*Corvus frugilegus*), Common starling (*Sturnus vulgaris*), reed oatmeal (*Emberiza shoeniclus*), finch (*Fringilla coelebs*), house and Spanish sparrows (*Passer domesticus*, *P. hispaniolensis*).

Only once were marked black-necked grebe (*Podiceps nigricollis*), the great white egret (*Ardea alba*), Common pochard (*Aythya ferina*), European honey buzzard (*Pernis apivorus*), Common snipe (*Gallinago gallinago*), mute swan (*Cygnus olor*), remez (*Remes pendulines*), Ortolan bunting (*Emberiza hortulana*), Dunnoek (*Prunara modularis*), Bluethroat (*Luscinia svecica*).

## 4. Conclusion

Thus, out of 17 clusters of birds that live in our republic, species belonging to 8 clusters are recorded on Lake Greater Shor. On the status of staying highlighted sedentary-15 species, migratory-nesting -3 species, wintering-6 species, at wintering, less often at nesting -2 species, migratory-nesting - 7 species, partially at wintering -1 species, rare and irregular migratory -1 species, migratory - 5 species, nesting and in some numbers wintering - 1 species, at nesting is usual and rare in winter. The Red Book species are noted on the Greater Shor Lake: Mute swan (*Cygnus olor*) (Red Book of the Azerbaijan Republic) and European honey buzzard (*Pernis apivorus*) (IUCN Red Book).

Analyzing the nature of the presence of bird species recorded

on Lake Greater Shor, we can assume that it formed in both the sedentary and migratory birds in the distant past, which is explained by their attachment to such a "littered" lake.

## References

- [1] Geoeological problems of Absheron. (2000). Azerbaijan Academy of Sciences. Earth Science Agenda. No. 1. Baku, Science: 76 p.
- [2] Mammadov, V. A., Efendieva, Sh. M., (1999). Ecological condition of Absheron lakes. Ecological monitoring of the coast of the Greater Caucasus, Baku and Sumgait. Baku, Science: 17-23.
- [3] <http://www.preslib.az/ru/eresources.html>
- [4] Aliev, S. I., Mamedov, V. A., (2016). Biodiversity of the lakes of the Absheron peninsula. Materials of reports of the II International Scientific and Practical Conference. Makhachkala: 9-15.
- [5] Sultanov, E., (2019) [https:// azertag.ru/ xeber / Vsemirny - den\\_pereletnyh\\_ptic\\_prohodit\\_pod\\_devizom\\_Zashchitite\\_ptic](https://azertag.ru/xeber/Vsemirny-den_pereletnyh_ptic_prohodit_pod_devizom_Zashchitite_ptic).
- [6] Dokter, A. M., Liechti, F., Stark, H., Delobbe, L., Tabary, P. And Holleman, I. (2011) Bird migration flight altitudes studied by a network of operational weather radars J. R. Soc. Interface 8: 30-43.
- [7] Heiss, M., Gauger, K. (2011) Costal bird migration at the Caspian shore of the Azerbaijan Republic in October 2007. Podoces 6: 59-71.
- [8] Hedenstöröm, A. (2010) Extreme Endurance Migration: What is the limit to non-stop flight? Plos Biol. 8: e1000362.
- [9] Hüppop, K., Diersche, J., Hill, R., Hüppop, O. (2012) Annual and diurnal phenology of birdcall activity above the German Bight. Volgerwarte 50: 87-108.
- [10] <http://www.epa.gov/ost/standards> U.S. EPA. (2002). Methods for Evaluating Wetland Condition: Biological Assessment Methods for Birds. Office of Water, U.S. Environmental Protection Agency, Washington, DC. EPA-822-R- 02-023., 16 p.
- [11] Ralph, C. J., Geupel, G. R., Pyle, P., Martin, T. E., DeSante, D. R. (1993). Handbook of Field Methods for Monitoring Landbirds. Gen. Tech. Rep. PSW-GTR-144. USDA Forest Serv, Albany, CA.
- [12] Ralph, C. J., Sauer, J. R., Droege, S. (eds). (1995). Monitoring Bird Populations by Point Counts. Gen. Tech. Rep. PSW-GTR-149. USDA Forest Serv, Albany, CA.
- [13] Bibby, C. J., Burgess, N. D., Hill, D. A. (1992). Bird Census Techniques. London: Academic Press.
- [14] Ribic, C. A., Lewis, S. J., Melvin, S., Bart, J., Peterjohn, B. (compilers). (1999). Proceedings of the Marsh Bird Monitoring Workshop. U. S. Fish and Wildlife Service, Denver, CO. Internet address: [http:// www. mp1-pwrc. usgs. gov/marshbird/](http://www.mp1-pwrc.usgs.gov/marshbird/)
- [15] Weller, M. W. (1999). Wetland Birds: Habitat Resources and Conservation Implications. Cambridge University Press. ISBN 0-521-63362-1.

- [16] Mammadov, V. A., (1999). Anthropogenic impact and lake ecosystems of Absheron. Ecological monitoring of the GREAT Baku and Sumgait coasts. Baku: 83-89.
- [17] Alekperov, A. B., (2000). Absheron: problems of hydrogeology and geoecology. Groundwater formation conditions for Absheron. Baku, Science: 39-51.
- [18] Mustafayev, Y., Mammadov, V., Salmanov, M., (2001). Absheron lakes, Baku. 52 p.
- [19] Aliyev, R. A., Mamedova, S. I., Abdurakhmanova, Z. Y., (1987). Macrozoobenthos of some lakes of the Absheron peninsula. News of ANAS. Series of the biological sciences. No. 1. Baku, Science: 77-85.
- [20] Mustafayev, G. T., Sadigova, N. A., (2005). The birds of Azerbaijan. Chashioğlu. 130 p.
- [21] Alizade, A. N., (1934). Hydrofauna of the Absheron Peninsula. Works of Zoology. Sector Az FAN USSR. vol. VII. Baku: 20-26.
- [22] Agamaliyev, F. G., (1980) Ciliates of brackish and saline lakes of the Absheron peninsula. Zoology Journal. issue 3, LIX. Baku, Science: 110-114.
- [23] Agamaliyev, F. G., Alieva, A. R., (1978). Microbenthos ciliates of some water bodies of the Absheron Peninsula. News of ANAS. Series of the biological sciences. No. 5. Baku, Science: 32-39.
- [24] Kasymov, A. G., (2003). Zooplankton of some lakes of Azerbaijan. Materials of the 1st Congress of the Society of Zoologists of Azerbaijan. Baku: 142-147.