



RESULTS OF THE TAXONOMIC ANALYSIS OF THE AVIFAUNA OF LAKE AQCHAKO'L

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<https://doi.org/10.5281/zenodo.20378314>

ARTICLE INFO

Received: 18th May 2026

Accepted: 22nd May 2026

Online: 23rd May 2026

KEYWORDS

Aral Sea region, Lake
Aqchako'l, avifauna,
migratory birds,
bioecology, wetlands,
species diversity,
biodiversity conservation.

ABSTRACT

The article examines the bioecological characteristics of the avifauna of the Aqchako'l Lake system located in the Aral Sea region. This area represents one of the key wetland ecosystems of Central Asia and serves as an important stopover, feeding, resting, and partially wintering site for migratory waterbirds and near-water bird species. The study investigates the natural and ecological conditions of the lake, the features of its hydrological regime, the status of food resources, and the role of wetland habitats in shaping avian species diversity. It was revealed that the presence of open water bodies, reed beds, and the connection with desert and delta landscapes provides favorable conditions for various ecological groups of birds. At the same time, alterations in the hydrological regime, intensified salinization processes, reduction of food resources, and anthropogenic pressure significantly influence bird abundance and distribution. The obtained results are important for assessing the current status of the avifauna and for developing conservation measures aimed at preserving biodiversity in wetland ecosystems of the Aral Sea region.

Introduction. The Aral Sea region, including the Aqchako'l Lake system, is one of the important wetland ecosystems of Central Asia and serves as a significant stopover, feeding, and partially wintering site for migratory birds. Numerous waterbirds and near-water bird species pass through this area during migration periods. However, in recent years, changes in the hydrological regime, intensified salinization processes, reduction of food resources, and

increasing anthropogenic pressure have led to noticeable changes in bird populations. This situation highlights the need for a comprehensive bioecological study of the avifauna in this region.

Lake Aqchako'l is located in the lower reaches of the Amu Darya River, approximately 25–30 km southeast of the foothills of the Sultan Uvays Mountains, within the Ellikkala District of the Republic of Karakalpakstan. The nearest settlement to the lake is Bo'ston,



the administrative center of Ellikkala District.

The Aqchako'l Lake and its surrounding wetland areas serve as important habitats for birds, providing feeding, resting, and, for some species, breeding sites. The hydrological conditions of the area, the presence of reed beds and open water bodies, as well as its connection with desert and delta landscapes, create favorable conditions for the occurrence of diverse ecological groups of birds.

In this context, the aim of the present study is to investigate the species composition, ecological characteristics, and seasonal distribution of the avifauna of the Aqchako'l Lake system, as well as to assess the impact of environmental factors on bird population dynamics. The obtained results are of significant importance for the conservation of biodiversity in the wetland ecosystems of the Aral Sea region and for the development of measures for their rational management and sustainable use.

Materials and methods. Field studies were conducted from 2025 to 2026 in Lake Aqchako'l and the surrounding wetland areas located in the Republic of Karakalpakstan. The research covered different biotopes of the area, including open water bodies, shoreline zones, reed beds, and desert-adjacent habitats. Observations were carried out mainly during the spring (March–May) and autumn (September–November) seasons, which represent the peak periods of migratory bird activity and are therefore of high importance for determining species composition and abundance.

Standard modern ornithological methods were applied in the study of avifauna and its ecological characteristics (Bibby et al., 2000; Sutherland, 2006). In addition, classical ecological observation methods proposed by G.A. Novikov (1953) were also used during fieldwork. Species identification was carried out using standard field guides, including Bird Guide, as well as the IOC World Bird List (Gill et al., 2025), based on internationally accepted taxonomic nomenclature. All recorded species were identified in accordance with current taxonomic standards.

Bird monitoring and counting were conducted using transect surveys, point count methods, visual observations, and acoustic recording techniques. In the transect method, observers moved along predefined routes on foot and by vehicle, recording bird species, abundance, and distribution. In the point count method, observations were conducted at selected stations for 5–20 minutes, during which all visible and audible birds were recorded. Species identification was based on morphological features such as body size, plumage coloration, wing and tail structure, flight behavior, and other behavioral traits, as well as vocalizations.

Photographic and video documentation techniques were used to verify species identification and to document rare species. At each observation point, key ecological parameters of the biotope were assessed, including vegetation cover, water level, salinity degree, proportion of open and closed habitats, and level of anthropogenic impact. The collected data were systematized, comparatively



analyzed, and used to assess bird distribution patterns and ecological characteristics across the study area.

Results. According to the study results, a total of 92 bird species belonging to 14 orders and 27 families were recorded in Lake Aqchako'l and the adjacent biotopes. The species composition indicates a predominance of birds adapted to aquatic and semi-aquatic habitats. This confirms the high ecological importance of Lake Aqchako'l for migratory and semi-aquatic bird species.

The highest species richness was observed in the order Charadriiformes, represented by 24 species. Members of this order are primarily adapted to wetland environments, and the ecological conditions of Lake Aqchako'l provide favorable habitats for them. The second most diverse order was Anseriformes, with 19 species, indicating the wide distribution of waterfowl, particularly ducks and geese, in the area.

In addition, Pelecaniformes and Accipitriformes were each represented by 9 species, forming groups of water-associated and predatory birds, respectively. The order Passeriformes was represented by 10 species, mainly associated with terrestrial and mixed habitats.

Other orders, including Podicipediformes (4 species), Falconiformes (4 species), Gruiformes (4 species), and Coraciiformes (3 species), showed moderate species diversity. The order Suliformes was represented by only 2 species. The lowest species richness was recorded in the orders Galliformes, Cuculiformes, Caprimulgiformes, and Bucerotiformes, each represented by only a single species (Table 1).

Table 1
Distribution of the Avifauna of Lake Aqchako'l by Orders

№	Order (Ordo)	Number of species
1	Podicipediformes	4
2	Pelecaniformes	9
3	Suliformes	2
4	Anseriformes	19
5	Accipitriformes	9
6	Falconiformes	4
7	Galliformes	1
8	Gruiformes	4
9	Charadriiformes	24
10	Cuculiformes	1
11	Caprimulgiformes	1
12	Coraciiformes	3
13	Bucerotiformes	1
14	Passeriformes	10
	Total	92

The distribution of species among the 92 bird species belonging to 14 orders recorded in Lake Aqchako'l and its surrounding areas was found to be uneven. Some orders were characterized by high species diversity, while others contained relatively few species. At the same time, the analyses showed that bird species requiring conservation attention and included in special protection lists are also found within these same orders.

The majority of bird species recorded in the Lake Aqchako'l area belong to the LC (Least Concern) category according to the International Union for Conservation of Nature (IUCN), indicating a low global risk of extinction. At the same time, several species requiring conservation attention were also recorded in the area. In particular, species such as *Podiceps*

auritus and *Aythya ferina* belong to Near Threatened or vulnerable groups. Species such as *Oxyura leucocephala* and *Aquila nipalensis* are of high conservation importance and require special attention and protection measures. These findings indicate that Lake Aqchako'l has significant ecological importance for the conservation of avian biodiversity not only at the regional but also at the global scale.

This further confirms that the Aqchako'l ecosystem is an important area for the survival, feeding, and migration of rare and threatened bird species (Table 2).

Table 2

Distribution of Bird Species in Lake Aqchako'l by IUCN Conservation Status

No	IUCN status	Description	Number of species
1	LC	Least Concern (low risk)	79
2	NT	Near Threatened (close to threatened)	6
3	VU	Vulnerable (at risk)	3
4	EN	Endangered (at high risk of extinction)	2
5	—	Not evaluated / no data available	2
	Total		92

Discussion. The majority of bird species recorded in the Lake Aqchako'l and surrounding areas, namely 79 species, belong to the LC (Least Concern) category, indicating a low global risk of extinction. At the same time, 6 species were classified as NT (Near Threatened), suggesting a potential risk of becoming threatened in the near future. According to the analysis, 3 species belong to the VU (Vulnerable) category, while 2 species

are classified as EN (Endangered). These species require special conservation attention due to declining population trends. In addition, the IUCN status of 2 species has not been determined.

These results demonstrate that Lake Aqchako'l and its surrounding habitats play an important ecological role in maintaining avian biodiversity and emphasize the need to strengthen



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monitoring and conservation measures for rare and threatened species.

Conclusion. Overall, the results of the study conducted in Lake Aqchako'l and its surrounding areas revealed a total of 92 bird species belonging to 14 orders, indicating a high level of avian diversity in the region. The distribution of species among orders was uneven, with some orders demonstrating higher species richness than others. Although the majority of recorded species belong to the LC category, species classified as NT, VU, and EN were also identified, indicating the presence of conservation-dependent taxa.

These findings demonstrate that Lake Aqchako'l is of significant ecological importance not only for common bird species but also for rare and threatened species. The results confirm the necessity of biodiversity conservation, protection of rare bird species, preservation of their habitats, and implementation of continuous monitoring programs. This information provides an important scientific basis for developing future recommendations on the conservation and sustainable management of the avifauna of the region..

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