



THE ASSESSMENT OF THE CURRENT STATUS OF THE SEDENTARY BIRD FAUNA SETTLED IN THE LANKARAN NATURAL PROVINCE OF AZERBAIJAN

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Abstract: The research work was carried out in 2013-2021. The sedentary bird fauna settled in the plain, foothill, and mountainous landscapes of the Lankaran natural province was studied. The species diversity, relationship characteristics with the biotope, and numbers of the terrestrial, water-wetland, and coastal birds distributed in the most diverse landscapes were studied. During the research process, the anthropogenic and natural factors influencing sedentary bird species and habitats were determined. It was determined that 79 species belonging to 10 orders, 28 families, and 64 genera comprise the sedentary bird fauna of the Lankaran natural province. In order to achieve sustainable development and effective protection of the populations of these species in nature, first of all, during the reproductive period, their nesting biotopes should be determined and protected as a natural monument.

Keywords: sedentary birds, species diversity, distribution, factors, Azerbaijan.

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Introduction

The ornithofauna of the South-Eastern region of Azerbaijan has always attracted the attention of various authors. Several articles have been written about the ornithofauna of the region since the 19th century until the end of the 20th century. (Aghayeva 1980; Drozdov 1963, 1965; Mustafayev & Aghayeva, 1969; Mustafayev 1974; Mustafayev & Kazimov 1965, 1966a; Satunin 1902). In these sources, the main

attention is directed to the birds migrating (nesting-migratory, wintering-migratory, migrant) to the area. This is due to the fact that the area is located on the internationally important Trans-Caspian migration route (i.e., the migration route from Europe to Africa, to Asia Minor and vice versa is intended). The information about the different sedentary bird species in the area, their registration, feeding, and nesting is also

provided in the existing literature. But this information is from the recent past. It does not allow for assessing the current state of the sedentary bird fauna of the area. Thus, in recent years, changes of anthropogenic origin have been taking place in the area of the Lankaran natural province in connection with the socio-economic development of our country. The population growth, intensive anthropogenic transformation of the landscapes (North-South highway, the increase in tourism and recreation centers, the expansion of cultivation, construction work, etc.) are observed in the region. (Mustafayev 2012; Rajabova & Karimov 2021; Ashrafzadeh et al. 2019; Mahmoudi et al. 2016; Tohidifar et al. 2016). Of course, all these do not go unnoticed by the population structure, relationships with the biotope, and habitats of the sedentary bird

species settled in the region. The current condition requires the implementation of monitoring of the sedentary bird fauna of the area and assessing their current status.

Taking into account the mentioned ones, we set a goal to study the distribution, species diversity, biotope relationships, and limiting factors of the sedentary bird fauna in the Lankaran natural region and to determine effective protection ways.

Materials and Methods

Research area

The research work was carried out in 2013-2021. According to its relief, the region consists of two parts: the Lankaran Lowland and the Talysh Mountains. Peaks: Komurgoy (2977 m), Gizyurdu (2433 m) (Figure 1).



Figure 1. The schematic map of the Lankaran natural province where the ornithological monitoring is conducted.

The climate is temperate-hot with dry summer. The steppe climate prevails in the high mountains. Since the province is located in a humid subtropical belt, the river network is dense. It is the wettest area of Azerbaijan. Unlike the Greater and Lesser

Caucasus, the precipitation decreases as altitude increases in the Talish Mountains. That is, after mountain forests, a steppe zone consisting of the mountain xerophytic plants is formed instead of the mountain meadows. Landscape: the forests, mountain steppes



consisting of xerophytic plants, anthropogenic landscape. The province is rich in endemic and relict plants. There are no semi-desert and nival-glacial landscapes in the province. The protected areas: Hirkan National Park (the endemic and relict plants are protected) ([The Geography of the Republic of Azerbaijan, 2015](#)).

Observations and registrations

Two main methods were used: stationary and movement by route. Both stationary and movement by route methods were used to determine and note the bird species, number, daily activity, connection level with the biotope (nesting, feeding, nighting, protection), feeding objects, and limiting factors. ([Heinzel et al. 1995](#); [Sultanov 2008](#)). The observations and registrations were carried out from a distance of 50–100–500 m, depending on the weather conditions and visibility. In the areas with favorable visibility, the observations were carried out visually, that is, with the naked eye. In the areas with complex relief, the observations were carried out with a telescope and binoculars from a distance of 500–1000 m. In the forest and shrub areas, the observations were carried out from a distance of 30–50 m. In dense forest areas and in foggy weather, we determined the species of the bird by its voice.

Totally, 257 expeditions were organized in the summer and winter seasons to 30 habitats of the sedentary bird species, starting from the Lankaran lowland and ending in the high mountainous zone. 1209 days were spent on these expeditions. 138 of the expeditions were to the Lankaran lowland (in summer and winter), 84 to the foothills, and 35 to the high mountainous areas. In order to determine the habitats of the sedentary bird species in the areas, in addition to our own observations, we also used the oral survey method. For this purpose, the information of the local ecological organizations, foresters, hunters, and the local population was taken into account and checked.

Results and Discussion

It was determined that the diversity of the landscapes and vertical zonation of the Lankaran natural province had a significant influence on the distribution and taxonomic spectrum of the sedentary bird species in the region. Thus, 10 out of 19 orders (52.6%) that form the ornithofauna of Azerbaijan are settled in the territory of this province. The multi-year monitoring conducted by us showed that the sedentary bird fauna of the region consists of 79 species belonging to 64 genera, 28 families and 10 orders (**Table 1**).

Table 1. The taxonomic spectrum of the sedentary birds settled in the Lankaran natural province.

№	The names and number of the orders	Family number	Genus number	Species number
1	<i>Podicipediformes</i>	1	1	1
2	<i>Ciconiiformes</i>	1	1	2
3	<i>Falconiformes</i>	1	8	9
4	<i>Galliformes</i>	1	4	4
5	<i>Gruiformes</i>	1	1	1
6	<i>Columbiformes</i>	1	3	4
7	<i>Strigiformes</i>	1	4	4
8	<i>Coraciiformes</i>	1	1	1
9	<i>Piciformes</i>	1	3	5
10	<i>Passeriformes</i>	19	38	48
Total		28	64	79

As can be seen from the table materials, the dominant birds of the area are species belonging to the *Passeriformes* order. More than 60 percent (79 species) of all species noted in the area are *Passeriformes*. The species belonging to this order have settled in all the vertical landscapes, including high mountain steppes, starting from coastal meadows. They even comprise the majority of the synanthropic species settled in the anthropogenic landscapes. Their ecological plasticity has allowed *Passeriformes* to spread in the natural and anthropogenic landscapes with the most diverse ecological conditions. They are the background birds of the area not only in terms of species

composition, but also in terms of the number of individuals. *Falconiformes*, represented by nine species, are the subdominant birds of the area. They constitute 10 percent of all the noted species. However, the number of individuals is not more. The number of species noted from the other orders was 1–5 species.

It should also be noted that the area of the Lankaran physical-geographical region (6.1 thousand km²) constitutes only 7% of the territory of the Republic of Azerbaijan (86,600 km²). However, the sedentary species settled in this province constitute approximately 47.0 percent of the sedentary species noted in the ornithofauna of Azerbaijan (**Figure 2**).

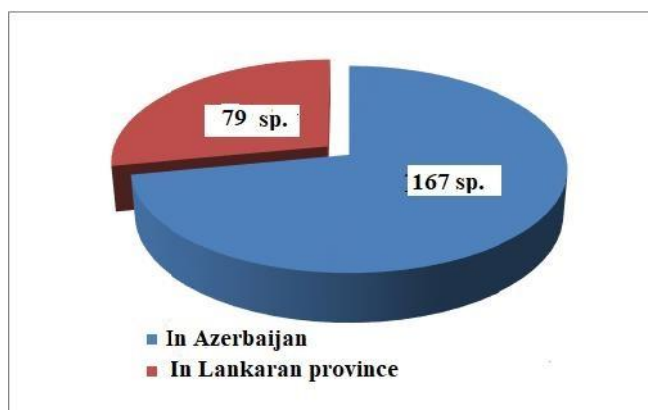


Figure 2. The proportion of the sedentary bird species noted in the territory of Azerbaijan and the Lankaran natural province.

The area of the Lankaran natural province has various relief forms (mountain ranges, lowlands, valleys, depressions, swamps, rivers, forests, rocks, etc.) and climatic conditions. It should be noted that there is a vertical regularity in the distribution of the forests in the Talish Mountains. These zones are divided into plain, low mountain, middle mountain, upper mountain, and mountain-meadow zones. It is these factors that had a significant influence on the species composition and numbers of the sedentary birds, starting from the sea coast and ending

in the high mountain zone. Thus, 58 species of sedentary birds were noted in the Lankaran lowland, 54 in the Talish mountain-forest zone and 35 in the Talish high mountain zone. A list of the sedentary species settled in different parts of the province is presented.

It was noted in the Lankaran lowland: *Podiceps nigricollis*, *Ardea alba*, *A. cinerea*, *Haliaeetus albicilla*, *Accipiter gentilis*, *Buteo rufinus*, *B. buteo*, *Aquila chrysaetos*, *Aegypius monachus*, *Gyps fulvus*, *Circus aeruginosus*, *Francolinus francolinus*, *Porphyrio porphyrio*, *Columba palumbus*,



C.livia, *Streptopelia decaocto*, *Spilopelia senegalensis* (**Figure 3a**), *Bubo bubo*, *Asio otus*, *Athene noctua*, *Strix aluco*, *Alcedo atthis*, *Picus viridis*, *Dendrocopos major*, *D.syriacus*, *D.minor*, *Galerida cristata*, *Melanocorypha calandra*, *Garrulus glandarius*, *Pica pica*, *Corvus frugilegus*, *C.cornix*, *Coloeus monedula*, *Troglodytes troglodytes*, *Prunella modularis*, *Cettia cetti*, *Regulus regulus*, *Turdus philomelos*, *Erithacus rubecula*, *Panurus biarmicus*, *Aegithalos caudatus*, *Remiz pendulinus*, *Parus major*, *Periparus ater*, *Sitta europaea*, *Tichodroma muraria*, *Certhia familiaris*, *Passer domesticus*, *P.hispaniolensis*, *P.montanus*, *Fringilla coelebs*, *Chloris chloris*, *Spinus spinus*, *Carduelis carduelis*, *Linaria cannabina*, *Coccothraustes coccothraustes*, *Emberiza calandra*, *E.cia*. The noted species are water-coast, aquatic, herbaceous, tree-shrub, low mountain-forest, and garden birds according to their connection characteristics with the biotope. The species noted (58 species) here constitute 73.4 percent of the sedentary species (79 species) settled in the Lankaran physical-geographical province. According to the species composition and numbers, the dominant birds of this area are species belonging to the *Passeriformes* order. *Passeriformes* (32 species) settled here constitute 40.5 percent of the sedentary species settled in the Lankaran physical-geographical province.

It was noted in the mountain-forest belt of Talish: *Accipiter gentilis*, *Buteo buteo*, *Aquila chrysaetos*, *Aegypius monachus*, *Gyps fulvus*, *Phasianus colchicus*, *Columba palumbus*, *C.livia*, *Streptopelia decaocto*, *Bubo bubo*, *Asio otus*, *Athene noctua*, *Strix aluco*, *Picus viridis*, *Dryocopus martius*, *Dendrocopos major*, *D.syriacus*, *D.minor*, *Galerida cristata*, *Melanocorypha calandra*, *Lullula arborea*, *Garrulus glandarius*, *Pica pica* (**Figure 3b**), *Corvus cornix*, *C.corax*,

Coloeus monedula, *Cinclus cinclus*, *Troglodytes troglodytes*, *Prunella modularis*, *Regulus regulus*, *Turdus torquatus*, *T.philomelos*, *T.viscivorus*, *Erithacus rubecula*, *Aegithalos caudatus*, *Parus major*, *Poecile hyrcanus*, *Periparus ater*, *Sitta europaea*, *S.neumayer*, *Tichodroma muraria*, *Certhia familiaris*, *Passer domesticus*, *P.montanus*, *Petronia petronia*, *Fringilla coelebs*, *Chloris chloris*, *Spinus spinus*, *Carduelis carduelis*, *Linaria cannabina*, *Pyrrhula pyrrhula*, *Coccothraustes coccothraustes*, *Emberiza calandra*, *E.cia*. The species (54 species) settled in this zone constitute 68.4 percent of all the species noted in the Lankaran natural province (79 species). The dominant birds of this area are species belonging to the *Passeriformes* order according to the species composition and numbers. *Passeriformes* (36 species) settled here constitute 45.6 percent of the sedentary species settled in the province. The abundance of the dendrophilic species in this zone is due to the widespread distribution of the foothill forests. These forests are distinguished by the richness of the relict and endemic species (*Albizia julibrissin*, *Parrotia persica*, *Zelkova*, *Gleditsia caspica*, *Ficus hyrcana*, etc.) of the Tertiary period. The limnodophilous species, whose habitat is connected with the aquatic environment, are not met here. The number of the petrophilous species is small.

It was noted in the high mountain belt of Talish: *Accipiter gentilis*, *Buteo rufinus*, *Aquila chrysaetos*, *Gypaetus barbatus*, *Aegypius monachus*, *Gyps fulvus*, *Alectoris chukar*, *Perdix perdix*, *Columba livia*, *Athene noctua*, *Dendrocopos syriacus*, *Melanocorypha calandra*, *Eremophila alpestris*, *Lullula arborea*, *Anthus spinoletta*, *Pyrrhocorax pyrrhocorax*, *Corvus cornix*, *C.corax*, *Coloeus monedula*, *Cinclus cinclus*, *Prunella collaris*, *Turdus torquatus*, *Sitta neumayer* (**Figure 3c**), *Tichodroma*

muraria, *Passer domesticus*, *Petronia petronia*, *Montifringilla nivalis*, *Fringilla coelebs*, *Serinus pusillus*, *Carduelis carduelis*, *Linaria flavirostris*, *L. cannabina*, *Pyrrhula pyrrhula*, *Emberiza calandra*, *E. cia*. Burada 35 növ oturaq quş növü qeydə alındı. Bunlar The total of all the sedentary species noted in the Lankaran natural region is 44.3 percent. The background species of

the area are birds (24 species) belonging to the *Passeriformes* order. They are 30.4 percent of the sedentary species in the province. The species distributed in this zone are mainly petrophilous, partly dendrophilic birds that prefer the mountain meadows, mountain-forest thickets, rocks, and mountain steppes.



Figure 3. (a) *Spilopelia senegalensis*; (b) *Pica pica*; (c) *Sitta neumayer*.

The results of the monitoring showed that the number of both species and individuals decreases gradually with increasing altitude (**Figure 4**). For comparison, let's note that while 58 species

are settled in the Lankaran lowland, 54 species are noted in the Talish mountain-forest belt, and only 35 sedentary species are noted in the high mountain belt ([Rajabova 2021](#)).

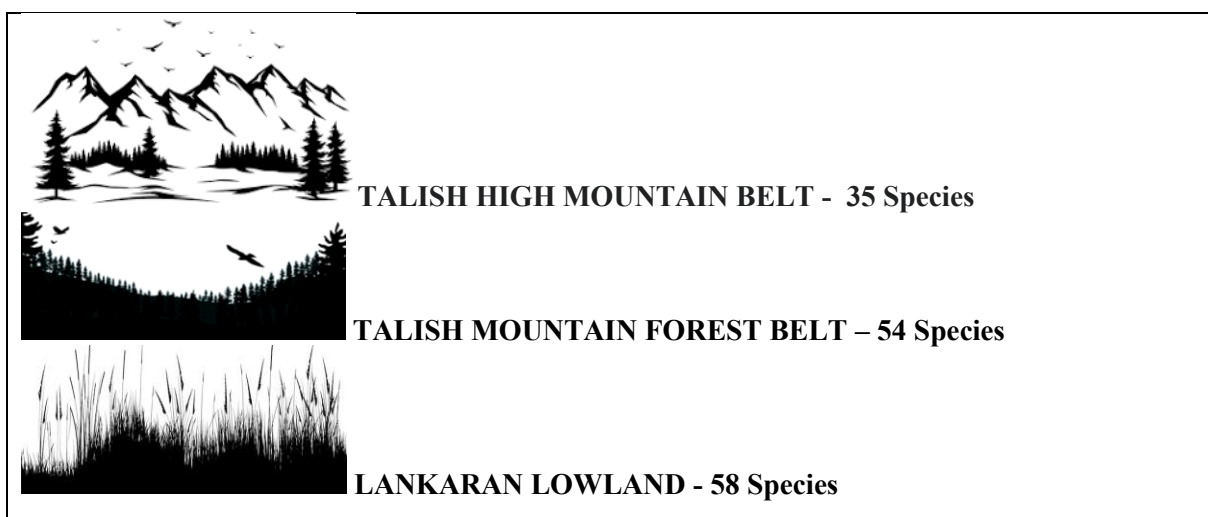


Figure 4. The number of sedentary species settled from the Lankaran lowland to the high mountain belt.



The decrease in the number of species with increasing altitude is due, on the one hand, to the presence of more natural complexes favorable for the birds in the Lankaran lowland, and, on the other hand, to the unique climate of the Talish Mountains (Burovar, Peshtasar ranges). Thus, the interaction of the complex relief with the atmospheric circulation leads to the formation of several climate types by altitude zones. The cold climate types of the steppes with dry summers are widespread for the higher parts of the Talish Mountains. As one rises in altitude, the temperature of the summer and winter months decreases, and the number of frost-free days lasts 120 days. The abundant precipitation falls during the cold period of the year. For this reason, most of the species settled in the high mountainous belt of Talish in the summer

season descend to the Lankaran lowland and forest belt, which have more favorable conditions, in the winter months to feed.

As we mentioned above, the population growth, intensive anthropogenic transformation of the natural landscapes, and density of the settlements in the Lankaran province also have a significant influence on the synanthropization level of the birds. This is due to the ecological plasticity of a number of species, their not running away from humans, and the availability of favorable living conditions (i.e., feeding, nesting, absence of enemies and competitors, etc.) in human settlements (mainly in the Lankaran lowland). As can be seen from the materials presented below, 49 species out of 79 sedentary species are noted in the settlements with various statuses (**Figure 5**).

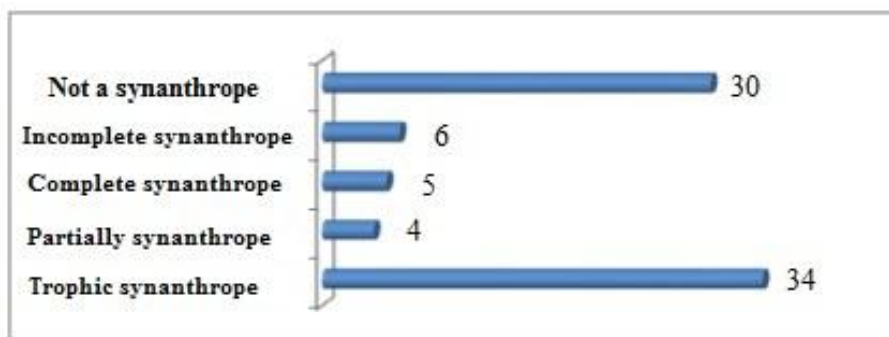


Figure 5. The synanthropization level of the sedentary bird species in the Lankaran natural province.

When talking about the sedentary bird fauna of this province, it is necessary to look at the history of its formation. The ornithofauna of the province (its flora and fauna as a whole) originally consisted of the ancient tropical fauna of Eurasia. As is known, the area of this natural province was not subjected to the glaciation of the III and IV periods. This is also confirmed by the relict and endemic fauna and flora specimens spread in the area. Currently, the endemic sedentary species such as the *Phasianus colchicus talischensis* and

Poecile hyrcanus, which are representatives of the glaciation period, have settled in the area of the province.

It should be noted that the changes occurred in the ornithofauna of the Palearctic during both the glaciation and post-glaciation periods. That is, the numerous young phylogenetic groups, tolerant of the dry and cold climate of the Palearctic, began to form and spread (Kobishev 1988; Karimov 2024). This process also took place in the area of the Lankaran physical-geographical province

located in the South-East of Azerbaijan. Thus, there were faunistic connections with the former fauna of the Afrotropics (including East Africa, the Arabian Peninsula, the Southern areas of Pakistan and Iran, and the islands of the Indian Ocean) and the Indomalayan zoogeographical zones located in the South of itself of the province (not subject to glaciation) (Kobishev 1988).

It is precisely the faunistic relations with the neighboring zoogeographic zones that have a significant impact on the formation of the sedentary bird fauna of the province. The compatibility of the ecological complexes in the province with the ecological complexes in their historical homelands has allowed the sedentary species noted by us today to spend a sedentary lifestyle in the area of the province.

The research work conducted by us showed that the sedentary bird fauna, which is a relic of the periods before and after the last IV glaciation, is exposed to the influence of several anthropogenic factors. Thus, the Lankaran physical-geographical province is one of the regions in the republic where the population is least provided with land. And this creates ecological problems for the sedentary bird fauna in the region where the natural ecosystems are exploited intensively, and the population is increasing. First of all, the reduction of forest and shrub areas, the expansion of recreation and tourism centers, the transport network, and intensive livestock grazing cause the reduction and permanent loss of the reproduction places of the sedentary birds. Illegal hunting and chemicals used in agriculture cause a decrease in numbers and a limitation of the food base. The current situation requires the environmental education of the local population and achieving public mass participation (nature lovers, schoolchildren are meant) in the process of bird protection. When the land

plots are given to the farmers and entrepreneurs (tourism, recreation, hotel, catering, etc. centers), they should be informed about the importance of bird protection and compliance with it (fines are provided for non-compliance).

Conclusion

The sedentary bird fauna of the Lankaran natural province is formed from 79 species belonging to 10 orders, 28 families and 64 genera. This sedentary bird fauna consists of various fauna types and endemic species of the Palearctic and is settled in uneven numbers in the area of the province. 58 sedentary species have been noted in the Lankaran lowland, 54 in the Talish mountain-forest belt, and 35 in the Talish high mountain belt. Depending on the climatic factors and the number of ecological complexes, the species composition and number of sedentary birds decrease gradually as the altitude increases. The intensive anthropogenic transformation of the natural landscapes influences the synanthropization level of the sedentary bird species. 62.0 percent of 79 sedentary species settled in the province are related to human settlements with the status of synanthropic species. The factors influencing the habitats and numbers of the sedentary bird fauna of the province are of anthropogenic origin and are related to human economic activity.

The materials collected by us about the sedentary bird fauna of the Lankaran natural province were used in the preparation of the books of the "Red Book" of the Republic of Azerbaijan (III edition, 2023), Information System of the Azerbaijan Fauna (2023), and Taxonomic Spectrum of the Azerbaijan Fauna (2020).

Conflict of Interest

The authors declare that there is no conflict of interest.



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