

**REPUBLIC OF AZERBAIJAN**

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**ABSTRACT**

of the dissertation for the degree of Doctor of Philosophy

**THE BIRDS OF THE SOUTH-EASTERN REGION OF  
AZERBAIJAN, THE FACTORS AFFECTING THEM AND  
THE PROTECTION WAYS**

Speciality: 2401.01 – “Zoology”

Field of Science: Biology

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## INTRODUCTION

**The actuality and elaboration level of the topic.** The rapid socio-economic development of our country, the anthropogenic transformation of the natural landscapes has taken a large scale in the last years. The anthropogenic transformation of the natural landscapes has a serious effect the habitats, species composition and numbers of the animals. These effects have a greater effect on the sedentary birds that are related to the concrete area. Because the sedentary birds adapt to the natural, climatic and trophic conditions of the concrete area settle there in the long evolutionary process. In contrast to the migratory-breeding, migratory-wintering and migratory birds, any changes that occur in the natural ecosystems where the sedentary species settle for hundreds of years cause to a decrease in their number, loss of their relationship with the habitat biotope (trophic, breeding, protection, overnight stay, etc.). As a result, the resistant, sustainable development of the natural ecosystems is weakening, and the adaptation to it requires a long time <sup>1</sup>.

The anthropogenic transformation of the natural landscapes (construction, transport, tourism, agriculture, cattle breeding, etc.) has intensified in the South-Eastern region of Azerbaijan. All these are actualizing the studying of the sedentary bird populations in that region. So the studying, effective protection and transmission to future generations of the bird fauna of Hirkan (the other is Colchis), which is one of 2 ecosystems in the Caucasus region that is not subject to glaciation, and its bordering areas, are considered one of the important tasks.

The ornithological researches were carried out mainly at the species level in the distant and recent dates in the South-Eastern region of Azerbaijan <sup>2, 3, 4, 5</sup>. In modern times, the investigation in the

<sup>1</sup> Karimov, T.A., Mammadov, A.F. The limiting factors of the carrion birds and the neutralization of them // – Nakhchivan: The news of ANAS Nakhchivan Department, The natural and technical sciences series, – 2015. v. 11, №2, – p. 222-229.

<sup>2</sup> Mustafayev, G.T. The protection of the birds (monograph) / G.T. Mustafayev, I.R. Babayev - Baki: Science, - 2012. - 255 p.

<sup>3</sup> Sadigova, N.A. The complex ecological evaluation of the anthropogenic factors influencing the birds of Azerbaijan: Doctor of Biological Sciences Diss. abstract. / – Baki, 2008. – 44 p.

## INTRODUCTION

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population level of the factors affecting the sedentary species in the region and the protection ways of them is one of the actual problems.

**The object and subject of the research.** In the South-Eastern region of Azerbaijan, the sedentary bird populations constitute the object of the research, and the studying parameters (according to the distribution of the fauna types, daily activity, densities, food character, distribution on the biotopes, level of the synanthropization, reproduction condition, sociology, development type, etc.) of the sedentary bird populations constitute the subject of the research.

**The goals and obligations of the research.** The main goal of the research work was to study the species composition of the sedentary birds, the natural and anthropogenic factors influenced them, and to determine the effective protection ways in the South-Eastern region of the Republic of Azerbaijan. In order to achieve this goal, the following obligations have been set:

1. The determining of the species composition of the sedentary birds;
2. The research of the settlement level on the vertical zonation and biotopes;
3. To investigate the bioecological characteristics of the sedentary birds in the area;
4. The analysis of the natural and anthropogenic factors influencing to the sedentary birds in the region;
5. To determine the protection ways of the sedentary birds, especially rare and endangered species in the research area.

**The methods of the research.** The settling of the sedentary species on the biotopes, the noting of the coordinates of them, the natural conditions of the area, the factors influencing to the species and habitat were studied and the photographs of some objects were

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<sup>4</sup> Sultanov, E.H. The Important Ornithological Areas of Azerbaijan. Greater and Lesser Caucasus, Southern region (Lankaran) / E.H.Sultanov, T.A.Karimov, S.A.Sarukhanova - Baki: Viktory, - 2011. - 144 p.

<sup>5</sup> Rajabova, S.S., Karimov, T.A. The composition and dynamics of the food spectrum of the Black Vulture (*Aegyptius monachus*) and Griffon Vulture (*Gyps fulvus*) in the Talysh region of Azerbaijan // The Journal of V.N.Karazin Kharkiv National University, - 2021. Issue 37, - p. 65-70.

taken by using the methods of the movement along the route and stationary observation.

**The main provisions taken to the defence:**

1. 79 species of the sedentary birds were researched in the research area.

2. During the reproduction period, the species composition of the settling on the vertical zonation was determined and the bioecological characteristics of it were investigated.

3. During the wintering period, the species composition of the settling on the vertical zonation was determined and the bioecological characteristics of it were investigated.

4. The protection ways of the rare and endangered sedentary bird populations in the region have been studied.

5. The practical recommendations were given for effective protection of the sedentary bird populations of the region.

**The scientific innovation of the research.** For the first time, in the South-Eastern region of Azerbaijan, the ornithological research work dedicated to the sedentary bird populations was conducted systematically on the basis of the complex-ecological parameters. For the first time, the taxonomic spectrum of the sedentary bird populations was determined and 79 sedentary bird species belonging to 64 genera, 28 families and 10 orders were noted in the area. In the region, the settling on the vertical zonation and location on the biotopes of the sedentary bird populations were determined, in the Lankaran plain, 58 species of the sedentary birds belonging to 10 orders, 26 families, 49 genera, in the mountain-forest belt of Talish, 54 species belonging to 6 orders, 20 families, 45 genera, and in the high mountain belt of Talish, 35 species belonging to 6 orders, 16 families, 32 genera were determined. For the first time, the nutritional character, level of the synanthropization, sociology, reproduction conditions, seasonal migrations during the wintering of the sedentary birds and reproduction periods, and the natural and anthropogenic factors influencing the birds were studied.

**The theoretical and practical significance of the research.** The materials of the research work plays the base role for the imple-

mentation of the ecological monitoring measures, the preparation and implementation of the effective protection programs of the sedentary bird populations during the reproduction and wintering periods in the region. The materials obtained on the ecological and ethological characteristics allow to use in the teaching of the zoology and ecology subjects. The theoretical importance of the research work will contribute to the formation of the resistant, sustainable development of the biodiversity in the nature with human intervention in the anthropogenic transformation conditions.

**The approbation and application of the research.** The main content of the dissertation was heard the Ganja European Youth Capital 2016, at the International Forum of the Young Scientists and Specialists on the topic of "The integration processes of the world science in the 21<sup>st</sup> century" (Ganja, October 10-14, 2016); At the "I International Scientific Conference of the Young Researchers" dedicated to the 94<sup>th</sup> anniversary of the birth of National Leader Heydar Aliyev (Baku, Baku Engineering University, May 5-6, 2017); At the Conference of the Young Scientists and Students on the topic of "The innovations and global challenges in modern biology and agricultural sciences" dedicated to the 90<sup>th</sup> anniversary of Academician Jalal Alirza oghlu Aliyev (Baku, Institute of Molecular Biology and Biotechnologies, October 31, 2018) and at the conference of The Materials of the International scientific-practical "Ecology and nature management» (Magas city, October 21-23, 2020).

**The name of the organization where the dissertation work was carried out.** The research work was carried out in the Laboratory of Terrestrial Vertebrates of the Institute of Zoology of the Ministry of Science and Education of the Republic of Azerbaijan.

**The structure and size of the dissertation work.** The dissertation work was 212646 mark sizes and consists of introduction (5909 marks), 7 chapters (201324 marks), result (3334 marks), practical proposals (2079 marks) and a list of 153 references which are in Azerbaijani, Russian and other languages and annexes. 6 tables and 23 pictures were given in the dissertation work.

## **CHAPTER I. THE NATURAL-GEOGRAPHICAL CONDITION OF THE SOUTH-EASTERN REGION OF AZERBAIJAN**

The South-Eastern region of Azerbaijan is known with its humid subtropics, the relict and endemic plants consisting of the flora of the III period all over the world, and has always the center of attention of the researchers. In addition to the relict and endemic trees, shrubs and herbs, more than 1900 species of the other plant species are spread in the plains and mountainous areas. This is equal to ~45% of all the plant species of our republic. 162 species (43.8%) of 370 endemic plant species of Azerbaijan are in Lankaran zone. The Lankaran natural region covers the Lankaran plain and the Talish mountains. The Talish mountains also consist of the lower, middle and high mountain-forest belts and high mountain belts of Talish. We have researched the sedentary species by the belts in the mountain-forest and high mountain belts of Talish and Lankaran plain by the vertical zonation. The natural ecosystems of the South-Eastern region of Azerbaijan, which has endemic and rare flora and partly fauna, have changed significantly due to the influence of the anthropogenic factors. People are cutting the forest of these places, changing the water regime of their rivers, lakes and swamps, turning their lands to the planting fields for more than a century, and as a result, they create the fundamental conditions for the loss of the nature equilibrium by disturbing the natural balance of it. In the last 50 years, the area of the Lankaran forests has decreased by more than 40 thousand ha <sup>6</sup>.

## **CHAPTER II. THE STUDY HISTORY OF THE SEDENTARY BIRDS IN THE SOUTH-EASTERN REGION OF AZERBAIJAN**

No scientific-research work has been conducted in relation to the sedentary birds species in the South-Eastern region of Azerbaijan, and in some works it is encountered the superficial information

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<sup>6</sup> The ecology of the vertebrate animals (a textbook for higher schools) / G.T.Mustafayev, N.A.Sadigova, A.T.Mammadov [etc.] – Baki: Baku University, - 2011. - 344 p.

in relation to the birds settled in that area (D.G.Tuayev, G.T.Mustafayev, I.R.Babayev, Ch.A.Aghayeva et al.). Formerly, some foreign scientists (K.A.Satunin, G.Laudon, E.Hartert et al.) conducted the short-term research in the area <sup>7, 8</sup>.

### CHAPTER III. MATERIALS AND METHODS

The research work was implemented in 2013-2021 in the South-Eastern region of the Azerbaijan Republic (in the Lankaran (38°45' N, 48°51' E) city, Masalli (39°02' N, 48 °39' E), Astara (38°30' N, 48°40' E), Lerik (38°47' N, 48°25' N) regions). The registration methods were used by the stationary observation and moving along a route. In order to specify the breeding and meeting places of the birds, the literature and local ecological organizations information (oral request) were used in addition to our own observations. In addition to this, the expeditions were organized to all the areas of the region. BSPB-10x40 binoculars, Carl Zeiss telescope 60x80 of the optical devices, camera and color specifiers, counting methods (Ravkin, 1978), the following formula were used for to determine the species of the birds:

$$K = \frac{40a + 10b + 3s + d}{L} \times 100\%$$

Here: K- shows the total number of the individuals per 1 km<sup>2</sup> area, a - the number of the individuals encountered up to 25 m from the researcher, b - the number of the individuals encountered up to 25-100 m from the researcher, s - the number of the individuals encountered up to 100-300 m from the researcher, d - the number of the individuals encountered at distances >300 m, L - the length of the route (in km). And the width of the route was determined individually according to the distance

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<sup>7</sup> Babayev, I.R., Mukhtarov, H.Sh., Karimov, T.A., Rajabova, S.S., Samadova, S.H. Birds (*Aves*) // Caucasian ecosystem: The Materials of the Yesterday, Today, Tomorrow "80 years of zoological research of the Caucasus" International Scientific Conference, November 23-24, 2016, - Baki: - 2018, - p. 400-415.

<sup>8</sup> Babayev, I.R., Mukhtarov, H.Sh., Karimov, T.A., Rajabova, S.S., Samadova, S.H. Ornithology laboratory // Caucasian ecosystem: The Materials of the Yesterday, Today, Tomorrow "80 years of zoological research of the Caucasus" International Scientific Conference, November 23-24, 2016, - Baki: - 2018, - p. 123-130.



from which the bird was seen. During the research, the number of species that appeared the closest was increased 40 times, those observed at a relatively distant distance 10, and those observed at a further distance 3. The distribution and counting of the birds was carried out during the reproduction and wintering periods. The density of the population was carried out with the usual count in the control areas of the individuals. The average result of the conducted counting was extrapolated to the total area where the species were distributed. The categories according to the density of the birds were determined according to A.P.Kuzyakin (1962) and G.T.Mustafayev (1985). The determination of the species was carried out from 25-100 m by the binoculars, and from 1-2 km by the telescope. The material was collected in 30 stationaries with a total area of 1466.0058 km<sup>2</sup> in 4 regions (Lankaran, Masalli, Astara, Lerik) conducted the research (Table 1). The determining the natural, anthropogenic and mixed causes of the distribution of each sedentary bird population helps to explain the observed regional variations in their life.

**Table 1**

**The research areas, number and areas of the stationaries**

№	Research areas	Area (km <sup>2</sup> )	The number of the stationaries
1.	Lankaran plain	1295.0058	13
2.	The mountain-forest belt of Talish	60	12
3.	The high mountain belt of Talish	111	5
The total research area		1466.0058	30

For the complex ecological assessment of the sedentary bird populations of the South-Eastern region of Azerbaijan, we based the concept of the complex-ecological landscape of G.T.Mustafayev (1985, 1994).

#### **CHAPTER IV. THE TAXONOMY OF THE SEDENTARY SPECIES IN THE SOUTH-EASTERN REGION OF AZERBAIJAN**

As a result of the research carried out in 2013-2021, the population of 79 species of the sedentary birds belonging to 10 orders, 28 families and 64 genera was noted in the South-Eastern region of

Azerbaijan (Table 2).

The taxonomic spectrum on orders of the species noted in the research areas is given in the following table (Table 2).

**Table 2**

**The taxonomic spectrum on orders of the ornithofauna in the South-Eastern region of Azerbaijan**

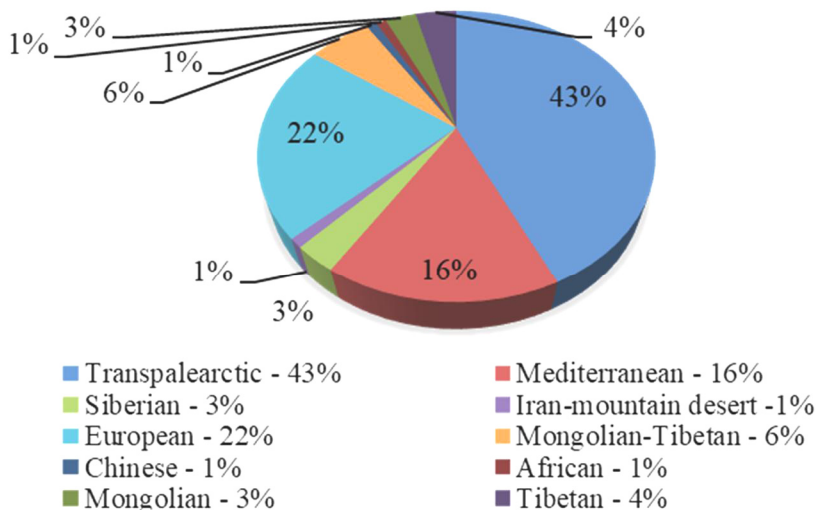
№	The names of the orders	The number of the family	The number of the genus	The number of the species
1.	<i>Podicipediformes</i>	1	1	1
2.	<i>Ciconiiformes</i>	1	1	2
3.	<i>Falconiformes</i>	1	8	9
4.	<i>Galliformes</i>	1	4	4
5.	<i>Gruiformes</i>	1	1	1
6.	<i>Columbiformes</i>	1	3	4
7.	<i>Strigiformes</i>	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

## CHAPTER V. THE COMPLEX EVALUATION OF THE SEDENTARY BIRD POPULATIONS IN THE SOUTH-EASTERN REGION OF AZERBAIJAN

In 2013-2021, as a result of our researches 79 species of the sedentary birds were determined in the South-Eastern region of Azerbaijan.

Most of the bird populations settled in the South-Eastern region of Azerbaijan belong to the Transpalearctic (43%), European (22%) and Mediterranean (16%) fauna types. The birds of the Transpalearctic type are dominant. In the research area, 6% of the other sedentary birds include to the Mongolian-Tibetan, 4% to the Tibetan, 3% to the Siberian, 3% to the Mongolian, 1% to the Iran-mountain desert, 1%

to the Chinese, and 1% to the African faunas (Figure 1).



**Figure 1. The division of the sedentary birds according to the fauna types in the South-Eastern region of Azerbaijan**

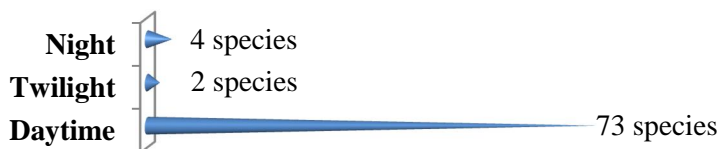
We have divided the sedentary bird populations on the Lankaran plain, mountain-forest and high mountain belts of Talish according to the settlement nature in the South-Eastern part of Azerbaijan.

The birds of the Transpalearctic (48%), European (24%) and Mediterranean (17.2%) types are predominant in the division of the sedentary bird populations according to the fauna types in the Lankaran plain. And the birds of the Transpalearctic fauna type dominate. In the Lankaran plain, 3.4% of the sedentary birds include to the Siberian, 3.4% to the Mongolian, 2% to the African, and 2% to the Tibetan faunas.

The birds of the Transpalearctic (46.2%), European (29.6%) and Mediterranean (12.9%) types are predominant in the mountain-forest belt of Talish. And the birds of the Transpalearctic fauna type dominate. In the mountain-forest belt of Talish, 3.7% of the sedentary birds include to the Siberian, 1.9% to the Iran-mountain desert, 1.9% to the Chinese, 1.9% to the Mongolian, and 1.9% to the Tibetan faunas.

The birds of the Transpalearctic (23%), Mediterranean (23%) and European (20%) types are predominant in the high mountain belt of Talish. And the birds of the Transpalearctic and Mediterranean fauna types dominate. In the high mountain belt of Talish, 14% of the sedentary birds include to the Mongolian-Tibetan, 8% to the Tibetan, 6% to the Mongolian, 3% to the Siberian, and 3% to the Iran-mountain desert faunas.

According to the diurnal activity of the sedentary birds in the South-Eastern region, 73 species of them are daytime birds, 4 species (*Bubo bubo*, *Asio otus*, *Athene noctua*, *Strix aluco*) are night birds, and 2 species (*Ardea alba*, *A.cinerea*) are twilight birds (Figure 2).



**Figure 2. The division of the sedentary birds according to the diurnal activity in the South-Eastern region of Azerbaijan**

According to the diurnal activity of the sedentary birds in the Lankaran plain, 2 species (*Ardea alba*, *A.cinerea*) of them are twilight birds, 4 species (*Bubo bubo*, *Asio otus*, *Athene noctua*, *Strix aluco*) are night birds, and 52 species are daytime birds.

According to the diurnal activity of the sedentary birds in the mountain-forest belt of Talish 50 species are daytime birds, and 4 species (*Bubo bubo*, *Asio otus*, *Athene noctua*, *Strix aluco*) are night birds.

According to the diurnal activity of the sedentary birds in the high mountain belt of Talish 34 species are daytime birds. And the night birds are one species (*Athene noctua*).

In the researched areas, it was determined that the populations of the sedentary birds include into four categories according to their densities: numerous, ordinary, rare and endangered birds.

According to the density of the populations of the sedentary birds in the Lankaran plain, during the wintering period, 18 species out of 58 species of the birds are endangered, 26 species are rare, 11

species are ordinary, 3 species are numerous, and during the reproduction period, 8 species out of 33 species of the birds are endangered, 11 species are rare, 8 species are ordinary, 6 species are numerous<sup>9, 10</sup> (Table 3).

**Table 3**

**The division according to the densities of the populations of the sedentary birds during the wintering and reproduction periods in the Lankaran plain (the number of the species)**

№	Species	Lankaran plain							
		During the wintering period				During the reproduction period			
		Endangered	Rare	Ordinary	Numerous	Endangered	Rare	Ordinary	Numerous
1.	<i>Podiceps nigricollis</i> - Black-necked Grebe		+				+		
2.	<i>Ardea alba</i> - Great White Egret			+				+	
3.	<i>A. cinerea</i> - Grey Heron		+					+	
4.	<i>Haliaeetus albicilla</i> - White-tailed Sea Eagle	+				+			
5.	<i>Accipiter gentilis</i> - Eurasian Goshawk	+							

<sup>9</sup> Rajabova, S.S. The quantitative indicators of the sedentary bird species and the factors influencing them in the Lankaran plain // - Baki: The Journal of Odla Yurdu University, - 2021. – p. 195-203.

<sup>10</sup> Taghiyev, A.N., Rajabova, S.S., Karimova, N., Safarova, I. The synanthropization level and density of the sedentary bird populations in the Lankaran plain // The Republican scientific conference on the topic of "The new directions of the development of the agricultural farms and the protection of the environment". (Online) Section IV: The new ecological influences formed by the modern farm complexes, - Baki: - January 30, - 2021, - p. 373-375.

The continuation of Table 3

6.	<i>Buteo rufinus</i> - Long-legged Buzzard	+						
7.	<i>B.buteo</i> - Common Buzzard	+						
8.	<i>Aquila chrysaetos</i> - Golden Eagle	+						
9.	<i>Aegyptius monachus</i> - Black Vulture	+						
10.	<i>Gyps fulvus</i> - Griffon Vulture	+						
11.	<i>Circus aeruginosus</i> - Marsh Harrier			+			+	
12.	<i>Francolinus francolinus</i> - Black Francolin		+				+	
13.	<i>Porphyrio porphyrio</i> - Purple Gallinule		+				+	
14.	<i>Columba palumbus</i> - Common Wood Pigeon		+					
15.	<i>C.livia</i> - Rock Dove			+				+
16.	<i>Streptopelia decaocto</i> - Collared Dove		+				+	
17.	<i>Spilopelia senegalensis</i> - Laughing Dove		+				+	
18.	<i>Bubo bubo</i> - Eurasian Eagle Owl	+				+		
19.	<i>Asio otus</i> - Long-eared Owl	+				+		
20.	<i>Athene noctua</i> - Little Owl		+			+		
21.	<i>Strix aluco</i> - Tawny Owl	+				+		
22.	<i>Alcedo atthis</i> - Common Kingfisher		+				+	
23.	<i>Picus viridis</i> - Eurasian Green Woodpecker	+				+		
24.	<i>Dendrocopos major</i> - Great Spotted Woodpecker	+				+		
25.	<i>D.syriacus</i> - Syrian Woodpecker	+						
26.	<i>D.minor</i> - Lesser Spotted Woodpecker	+						
27.	<i>Galerida cristata</i> - Crested Lark			+				+
28.	<i>Melanocorypha calandra</i> - Calandra Lark			+				+
29.	<i>Garrulus glandarius</i> - Jay	+				+		
30.	<i>Pica pica</i> - Magpie		+				+	

The continuation of Table 3

31.	<i>Corvus frugilegus</i> - Rook			+				+	
32.	<i>C. cornix</i> - Hooded Crow		+					+	
33.	<i>Coloeus monedula</i> - Eurasian Jackdaw		+						
34.	<i>Troglodytes troglodytes</i> - Wren		+						
35.	<i>Prunella modularis</i> - Dunnock		+						
36.	<i>Cettia cetti</i> - Cetti's Warbler		+					+	
37.	<i>Regulus regulus</i> - Goldcrest	+							
38.	<i>Turdus philomelos</i> - Song Thrush		+						
39.	<i>Erithacus rubecula</i> - European Robin		+						
40.	<i>Panurus biarmicus</i> - Breaded Parrotbill					+			+
41.	<i>Aegithalos caudatus</i> - Long-tailed Tit		+						
42.	<i>Remiz pendulinus</i> - Eurasian penduline-tit					+			+
43.	<i>Parus major</i> - Great Tit		+						
44.	<i>Periparus ater</i> - Coal Tit		+						
45.	<i>Sitta europaea</i> - Eurasian Nuthatch		+					+	
46.	<i>Tichodroma muraria</i> - Wall-creeper	+							
47.	<i>Certhia familiaris</i> - Eurasian Treecreeper	+							
48.	<i>Passer domesticus</i> - House Sparrow					+			+
49.	<i>P. hispaniolensis</i> - Spanish Sparrow					+			+
50.	<i>P. montanus</i> - Tree Sparrow					+			+
51.	<i>Fringilla coelebs</i> - Common Chaffinch					+			+
52.	<i>Chloris chloris</i> - Common Greenfinch					+			
53.	<i>Spinus spinus</i> - Eurasian Siskin		+						
54.	<i>Carduelis carduelis</i> - European Goldfinch		+					+	

**The continuation of Table 3**

55.	<i>Linaria cannabina</i> - Eurasian Linnet		+						
56.	<i>Coccothraustes coccothraustes</i> - Hawfinch		+						
57.	<i>Emberiza calandra</i> - Corn Bunting			+					+
58.	<i>E.cia</i> - Rock Bunting		+						
Total		18	26	11	3	8	11	8	6

The studying of the population densities of the sedentary birds in the mountain-forest belt of Talish, depending on the seasons, shows that during the wintering period, 8 out of 54 species of the birds are rare, 17 are ordinary, 29 are numerous, and during the reproduction period, 8 out of 52 species of the birds rare, 11 are ordinary, 33 are numerous <sup>11</sup> (Table 4).

**Table 4**

**The division according to the densities of the populations of the sedentary birds during the wintering and reproduction periods in the mountain-forest belt of Talish (the number of the species)**

№	Species	The mountain-forest belt of Talish					
		During the wintering period			During the reproduction period		
		Rare	Ordinary	Numerous	Rare	Ordinary	Numerous
1.	<i>Accipiter gentilis</i> - Eurasian Goshawk	+			+		
2.	<i>Buteo buteo</i> - Common Buzzard		+			+	
3.	<i>Aquila chrysaetos</i> - Golden Eagle	+			+		
4.	<i>Aegypius monachus</i> - Black Vulture	+			+		
5.	<i>Gyps fulvus</i> - Griffon Vulture	+			+		

<sup>11</sup> Rajabova, S.S. The species composition and quantitative indicators of the sedentary birds, forming winter ornithocomplexes in the mountain-forest belt of Talish // Journal of life sciences and biomedicine, - 2021, Volume 3 (76), №1, - p. 91-98.



The continuation of Table 4

6.	<i>Phasianus colchicus</i> - Common Pheasant	+			+		
7.	<i>Columba palumbus</i> - Common Wood Pigeon		+				+
8.	<i>C.livia</i> - Rock Dove			+			+
9.	<i>Streptopelia decaocto</i> - Collared Dove		+			+	
10.	<i>Bubo bubo</i> - Eurasian Eagle Owl	+			+		
11.	<i>Asio otus</i> - Long-eared Owl	+			+		
12.	<i>Athene noctua</i> - Little Owl		+			+	
13.	<i>Strix aluco</i> - Tawny Owl		+			+	
14.	<i>Picus viridis</i> - Eurasian Green Woodpecker			+			+
15.	<i>Dryocopus martius</i> - Black Woodpecker		+			+	
16.	<i>Dendrocopos major</i> - Great Spotted Woodpecker			+			+
17.	<i>D.syriacus</i> - Syrian Woodpecker		+			+	
18.	<i>D.minor</i> - Lesser Spotted Woodpecker			+			+
19.	<i>Galerida cristata</i> - Crested Lark			+			+
20.	<i>Melanocorypha calandra</i> - Calandra Lark			+			+
21.	<i>Lullula arborea</i> - Woodlark			+			+
22.	<i>Garrulus glandarius</i> - Jay			+			+
23.	<i>Pica pica</i> - Magpie		+			+	
24.	<i>Corvus cornix</i> - Hooded Crow		+				+
25.	<i>C.corax</i> - Raven		+			+	
26.	<i>Coloeus monedula</i> - Eurasian Jackdaw		+				+
27.	<i>Cinclus cinclus</i> - White-throated Dipper		+			+	
28.	<i>Troglodytes troglodytes</i> - Wren		+				+
29.	<i>Prunella modularis</i> - Dunnock			+			+
30.	<i>Regulus regulus</i> - Goldcrest			+			+
31.	<i>Turdus torquatus</i> - Ring Ouzel			+			
32.	<i>T.philomelos</i> - Song Thrush			+			+
33.	<i>T.viscivorus</i> - Mistle Thrush			+			+
34.	<i>Erithacus rubecula</i> - European Robin			+			+
35.	<i>Aegithalos caudatus</i> - Long-tailed Tit			+			+

The continuation of Table 4

36.	<i>Parus major</i> - Great Tit			+			+
37.	<i>Poecile hyrcanus</i> - Caspian Tit	+			+		
38.	<i>Periparus ater</i> - Coal Tit			+			+
39.	<i>Sitta europaea</i> - Eurasian Nuthatch			+			+
40.	<i>S.neumayer</i> - Western Rock Nuthatch			+			+
41.	<i>Tichodroma muraria</i> - Wallcreeper		+			+	
42.	<i>Certhia familiaris</i> - Eurasian Treetreeper			+			+
43.	<i>Passer domesticus</i> - House Sparrow			+			+
44.	<i>P.montanus</i> - Eurasian Tree Sparrow			+			+
45.	<i>Petronia petronia</i> - Rock Sparrow		+				+
46.	<i>Fringilla coelebs</i> - Common Chaffinch			+			+
47.	<i>Chloris chloris</i> - Common Greenfinch			+			+
48.	<i>Spinus spinus</i> - Eurasian Siskin			+			+
49.	<i>Carduelis carduelis</i> - European Gold- finch			+			+
50.	<i>Linaria cannabina</i> - Eurasian Linnet			+			+
51.	<i>Pyrrhula pyrrhula</i> - Eurasian Bull- finch		+				
52.	<i>Coccothraustes coccothraustes</i> - Hawfinch			+			+
53.	<i>Emberiza calandra</i> - Corn Bunting			+			+
54.	<i>E.cia</i> - Rock Bunting		+			+	
Total		8	17	29	8	11	33

During the wintering period, 6 species out of 35 species of the birds are endangered 15 species are rare, 11 species are ordinary, 3 species are numerous, and during the reproduction period, 2 species are endangered, 9 species are rare, 15 species are ordinary, 9 species are numerous according to the densities of the populations of the sedentary birds in the high mountain belt of Talish <sup>12</sup> (Table 5).

<sup>12</sup> Rajabova, S.S., Babayev, I.R. The species composition, quantitative indicators of the sedentary birds and the factors influencing them in the high mountain belt of Talish // - Baki: Proceedings of the Azerbaijan Society of Zoologists of ANAS, - 2017. - p. 84-93.

**Table 5**

**The division according to the densities of the populations of the sedentary birds during the wintering and reproduction periods in the high mountain belt of Talish (the number of the species)**

№	Species	The high mountain belt of Talish							
		During the wintering period				During the reproduction period			
		Endangered	Rare	Endangered	Rare	Endangered	Rare	Endangered	Rare
1.	<i>Accipiter gentilis</i> - Eurasian Goshawk	+				+			
2.	<i>Buteo rufinus</i> - Long-legged Buzzard	+					+		
3.	<i>Aquila chrysaetos</i> - Golden Eagle		+				+		
4.	<i>Gypaetus barbatus</i> - Bearded Vulture	+					+		
5.	<i>Aegypius monachus</i> - Black Vulture		+				+		
6.	<i>Gyps fulvus</i> - Griffon Vulture		+				+		
7.	<i>Alectoris chukar</i> - Chukar			+				+	
8.	<i>Perdix perdix</i> - Grey Partridge		+					+	
9.	<i>Columba livia</i> - Rock Dove			+					+
10.	<i>Athene noctua</i> - Little Owl		+				+		
11.	<i>Dendrocopos syriacus</i> - Syrian Woodpecker		+			+			
12.	<i>Melanocorypha calandra</i> - Calandra Lark			+					+
13.	<i>Eremophila alpestris</i> - Horned Lark	+					+		
14.	<i>Lullula arborea</i> - Woodlark		+						+

The continuation of Table 5

15.	<i>Anthus spinoletta</i> - Water Pipit	+						+	
16.	<i>Pyrrhocorax pyrrhocorax</i> - Red-billed Chough		+					+	
17.	<i>Corvus cornix</i> - Hooded Crow			+				+	
18.	<i>C.corax</i> - Raven		+				+		
19.	<i>Coloeus monedula</i> - Jackdaw		+					+	
20.	<i>Cinclus cinclus</i> - White-throated Dipper		+					+	
21.	<i>Prunella collaris</i> - Alpine Accentor		+					+	
22.	<i>Turdus torquatus</i> - Ring Ouzel		+					+	
23.	<i>Sitta neumayer</i> - Western Rock Nuthatch			+					+
24.	<i>Tichodroma muraria</i> - Wallcreeper			+				+	
25.	<i>Passer domesticus</i> - House Sparrow				+				+
26.	<i>Petronia petronia</i> - Rock Sparrow		+					+	
27.	<i>Montifringilla nivalis</i> - White-winged Snowfinch	+					+		
28.	<i>Fringilla coelebs</i> - Common Chaffinch			+					+
29.	<i>Serinus pusillus</i> - Red-fronted Serin			+				+	
30.	<i>Carduelis carduelis</i> - European Goldfinch			+				+	
31.	<i>Linaria flavirostris</i> - Twite			+				+	
32.	<i>L.cannabina</i> - Eurasian Linnet				+				+
33.	<i>Pyrrhula pyrrhula</i> - Eurasian Bullfinch		+					+	
34.	<i>Emberiza calandra</i> - Corn Bunting			+					+
35.	<i>E.cia</i> - Rock Bunting				+				+
Total		6	15	11	3	2	9	15	9

In the South-Eastern region of the Republic of Azerbaijan, based according to the food character, the sedentary birds can be divided into 3 categories: phytophage, zoophagus (including entomophage, ichthyophage, predatory) and euryphage birds. The zoophagus birds predominate in the area (46%). 20 species (56%) of the zoophagus birds are entomophages, 1 species (3%) - *Alcedo atthis* is ichthyophage, 13 species (36%) are predators. The euryphage birds (those that feed with the animals, both plants and carrion) are 31 species, and phytophage birds are 12 species (15%) (Table 6).

**Table 6**  
**The division of the sedentary birds according to their food character in the South-Eastern region of Azerbaijan**

№	Categories	Number	with %
1	Phytophage birds	12	15
2	Zoophagus birds	36	46
3	Euryphage birds	31	39
Total		79	100

In the Lankaran plain, the zoophagus (30 species, 52%) and euryphage (20 species, 34%) ecological group birds predominate according to the food character of the sedentary bird populations. 50% (15 species) of the zoophagus birds are entomophages, 3% (*Alcedo atthis*) is ichthyophage, 40% (12 species) are predators. And phytophage birds are 14% (5 species).

The zoophagus (24 species, 44%) and euryphage (23 species, 43%) birds from the sedentary bird populations predominate in the mountain-forest belt of Talish. 63% (15 species) of the zoophagus birds are entomophages, and 37% (9 species) are predators. And phytophage birds are 13% (7 species).

The eryphage (17 species, 49%) and zoophagus (13 species, 37%) birds from the sedentary species predominate in the high mountain belt. And phytophage birds are 14% (8 species). 46% (6 species) of the zoophagus birds are entomophages, and 54% (7 species) are predators.

The dendrophilous birds dominate in the sedentary bird populations in the areas conducted the research, and are 51% (40 species). The petrophilous birds are 25% (20 species), limnodophilous birds are 11% (*Podiceps nigricollis*, *Ardea alba*, *A.cinerea*, *Circus aeruginosus*, *Porphyrio porphyrio*, *Alcedo atthis*, *Cinclus cinclus*, *Cettia cetti*, *Panurus biarmicus*), eurytopian birds are 4% (*Aquila chrysaetos*, *Aegypius monachus*, *Columba livia*), synanthropic birds are 1% (*Athene noctua*).

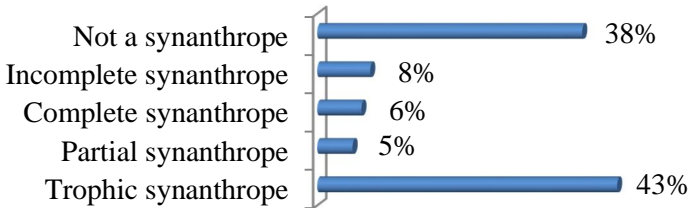
The dendrophilous birds from the sedentary birds dominate, and are 59% (34 species) in the Lankaran plain. The limnodophilous birds are 14% (*Podiceps nigricollis*, *Ardea alba*, *A.cinerea*, *Circus aeruginosus*, *Porphyrio porphyrio*, *Alcedo atthis*, *Cettia cetti*, *Panurus biarmicus*), petrophilous birds are 10% (*Buteo rufinus*, *Gyps fulvus*, *Galerida cristata*, *Melanocorypha calandra*, *Emberiza calandra*, *E.cia*), eurytopian birds are 5% (*Aquila chrysaetos*, *Aegypius monachus*, *Columba livia*), synanthropic birds are 2% (*Athene noctua*).

The dendrophilous birds from the sedentary birds dominate, and are 66.6% (36 species) in the mountain-forest belt of Talish. The petrophilous birds are 16.6% (*Gyps fulvus*, *Galerida cristata*, *Melanocorypha calandra*, *Corvus corax*, *Turdus torquatus*, *Sitta neumayer*, *Petronia petronia*, *Emberiza calandra*, *E.cia*), eurytopian birds are 5.5% (*Aquila chrysaetos*, *Aegypius monachus*, *Columba livia*), limnodophilous birds are 1.9% (*Cinclus cinclus*), synanthropic birds are 1.9% (*Athene noctua*).

The petrophilous birds from the sedentary birds dominate, and are 54% (19 species) in the high mountain belt. The dendrophilous birds are 25.7% (*Accipiter gentilis*, *Dendrocopos syriacus*, *Lullula arborea*, *Coloeus monedula*, *Tichodroma muraria*, *Fringilla coelebs*, *Carduelis carduelis*, *Linaria cannabina*, *Pyrrhula pyrrhula*), eurytopian birds are 9% (*Aquila chrysaetos*, *Aegypius monachus*, *Columba livia*), limnodophilous birds are 2.8% (*Cinclus cinclus*), synanthropic birds are 2.8% (*Athene noctua*).

In the South-Eastern part of the Republic of Azerbaijan, according to the synanthropization level, 34 species of the sedentary birds are trophic synanthropes, 4 species (*Haliaeetus albicilla*, *Aquila chrysaetos*, *Sitta neumayer*, *Fringilla coelebs*) are partial synanthropes, 5 species

are complete synanthropes, 6 species are incomplete synanthropes, and 30 species are not synanthropes<sup>10</sup> (Figure 3).



**Figure 3. The division of the sedentary birds according to the synanthropization level in the South-Eastern region of Azerbaijan**

In the Lankaran plain, according to the synanthropization level of the sedentary birds, 27 (46.6%) species are trophic synanthropes, 3 species (5.2%) (*Haliaeetus albicilla*, *Aquila chrysaetos*, *Fringilla coelebs*) are partial synanthropes, 5 species (8.6%) (*Streptopelia decaocto*, *Spilopelia senegalensis*, *Pica pica*, *Passer domesticus*, *Chloris chloris*) are complete synanthropes, 5 species (8.6%) (*Columba livia*, *Athene noctua*, *Corvus cornix*, *Turdus philomelos*, *Parus major*) are incomplete synanthropes, and 18 (31%) species are not synanthropes.

In the mountain-forest belt of Talish, 21 species (39%) of the sedentary birds are trophic synanthropes, 3 species (6%) (*Aquila chrysaetos*, *Sitta neumayer*, *Fringilla coelebs*) are partial synanthropes, 4 species (7%) (*Streptopelia decaocto*, *Pica pica*, *Passer domesticus*, *Chloris chloris*) are complete synanthropes, 6 species (11%) (*Columba livia*, *Athene noctua*, *Corvus cornix*, *Turdus philomelos*, *Turdus viscivorus*, *Parus major*) are incomplete synanthropes, and 20 species (37%) are not synanthropes.

In the high mountain belt, according to the synanthropization level of the sedentary birds, 15 species (42.9%) are trophic synanthropes, 3 species (8.6%) (*Aquila chrysaetos*, *Sitta neumayer*, *Fringilla coelebs*) are partial synanthropes, 1 species (2.9%) (*Passer domesticus*) is complete synanthrope, 3 species (8.6%) (*Columba livia*, *Athene noctua*, *Corvus cornix*) are incomplete synanthropes, and 13 species (37%) are not synanthropes.

In the areas conducted the research, 50 species (63%) of the sedentary birds nest in the open condition, 17 species (22%) in the covered condition, and 12 species (15%) in the open-covered condition according to the reproduction condition.

In the Lankaran plain, 35 species (60%) of the sedentary birds nest in the open condition, 15 species (26%) in the covered condition, and 8 species (14%) (*Asio otus*, *Garrulus glandarius*, *Troglodytes troglodytes*, *Regulus regulus*, *Erithacus rubecula*, *Sitta europaea*, *Passer domesticus*, *P.hispaniolensis*) in the open-covered condition according to the reproduction condition.

In the mountain-forest belt of Talish, 30 species (55.5%) of the sedentary birds nest in the open condition, 15 species (27.8%) in the covered condition, and 9 species (16.7%) (*Asio otus*, *Garrulus glandarius*, *Cinclus cinclus*, *Troglodytes troglodytes*, *Regulus regulus*, *Erithacus rubecula*, *Sitta europaea*, *S.neumayer*, *Passer domesticus*) in the open-covered condition according to the reproduction condition.

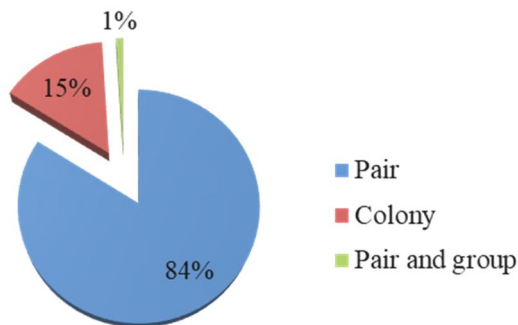
In the high mountain belt, 24 species (69%) of the sedentary birds nest in the open condition, 6 species (17%) (*Columba livia*, *Athene noctua*, *Dendrocopos syriacus*, *Coloeus monedula*, *Tichodroma muraria*, *Petronia petronia*) in the covered condition, and 5 species (14%) (*Cinclus cinclus*, *Sitta neumayer*, *Passer domesticus*, *Montifringilla nivalis*, *Serinus pusillus*) in the open-covered condition according to the reproduction condition.

66 species of the sedentary bird populations in the South-Eastern region of Azerbaijan form pairs, 12 species (*Columba livia*, *Strix aluco*, *Pyrhacorax pyrrhacorax*, *Corvus frugilegus*, *C.cornix*, *Coloeus monedula*, *Panurus biarmicus*, *Poecile hyrcanus*, *Passer hispaniolensis*, *P.montanus*, *Petronia petronia*, *Montifringilla nivalis*) form colonies, and 1 species (*Pica pica*) forms both pairs and groups according to their sociology<sup>13</sup> (Figure 4).

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<sup>13</sup> Taghiyev, A.N., Rajabova, S.S., Karimova, N., Safarova, I. The reproduction condition and sociology of the sedentary bird populations in the Lankaran plain // The Republican scientific conference on the topic of "The new directions of the development of the agricultural farms and the protection of the environment". (Online) Section IV: The new ecological influences formed by the modern farm complexes, - Baki: - January 30, - 2021, - p. 376-378.





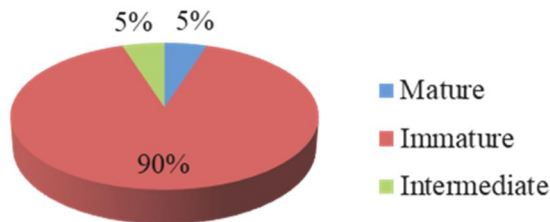
**Figure 4. The division of the sedentary birds according to the sociology in the South-Eastern region of Azerbaijan**

49 bird species (84%) of the sedentary bird populations in the Lankaran plain form pairs, 8 bird species (14%) (*Columba livia*, *Strix aluco*, *Corvus frugilegus*, *C.cornix*, *Coloeus monedula*, *Panurus biarmicus*, *Passer hispaniolensis*, *P.montanus*) form colonies according to their sociology. And 1 bird species (2%) (*Pica pica*) lives both in pairs and in groups.

In the mountain-forest belt of Talish, according to the sociology of the sedentary birds, 46 species (85%) of them form pairs, 7 species (13%) (*Columba livia*, *Strix aluco*, *Corvus cornix*, *Coloeus monedula*, *Poecile hyrcanus*, *Passer montanus*, *Petronia petronia*) form colonies. And 1 species (2%) (*Pica pica*) lives both in pairs and in groups.

In the high mountain belt, according to the sociology of the sedentary birds, 29 species (83%) of them live in pairs, and 6 species (17%) (*Columba livia*, *Pyrrhocorax pyrrhocorax*, *Corvus cornix*, *Coloeus monedula*, *Petronia petronia*, *Montifringilla nivalis*) live in colonies.

71 species of the sedentary bird populations are immatures, 4 species (*Alectoris chukar*, *Francolinus francolinus*, *Perdix perdix*, *Porphyrio porphyrio*) are matures, and 4 species (*Ardea alba*, *A.cinerea*, *Circus aeruginosus*, *Athene noctua*) are intermediates according to their development type in the region conducted the research (Figure 5).



**Figure 5. The division of the sedentary birds according to the development type in the South-Eastern region of Azerbaijan**

In the Lankaran plain, according to the development type of the sedentary birds, 52 species (90%) of them are immatures, 2 species (3%) (*Francolinus francolinus*, *Porphyrio porphyrio*) are matures, and 4 species (7%) (*Ardea alba*, *A.cinerea*, *Circus aeruginosus*, *Athene noctua*) are intermediate species.

In the mountain-forest belt of Talish, according to the development type of the sedentary birds, 53 species (98%) of them are immatures, and 1 species (2%) (*Athene noctua*) is intermediate.

In the high mountain belt, according to the development type of the sedentary birds, 32 species (91%) of them are immatures, 2 species (6%) (*Alectoris chukar*, *Perdix perdix*) are matures, and 1 species (3%) (*Athene noctua*) is an intermediate species.

The endemic species for the mountain-forest belt of Talish: *Phasianus colchicus talischensis*, *Poecile hyrcanus*.

The birds given as sedentary species in the literature information but not observed as sedentary species in our research: *Ardeola ralloides*, *Tadorna tadorna*, *Falco peregrinus*, *Pterocles alchata*, *Dendrocopos medius*, *Calandrella brachydactyla*, *Motacilla cinerea*, *Oenanthe finschii*, *Pyrrhocorax graculus*.

For the first time, the species that we noted as a sedentary population in the research area (in the literature information, these birds are given as wintering, migratory, nesting, etc., or there is no information about these birds): *Buteo rufinus*, *Columba palumbus*, *Dendrocopos minor*, *Lullula arborea*, *Erithacus rubecula*, *Regulus regulus*, *Periparus ater*, *Sitta europaea*, *Tichodroma muraria*.

One group of the birds settled in the South-Eastern region of Azerbaijan descends the Lankaran plain from the mountain-forest and high mountain belts of Talish, and the other group the mountain-forest belt of Talish from the high mountain belt of Talish during the wintering period due to the lack of the food base. These bird species are given as follows:

The species descended the Lankaran plain from the mountain-forest belt of Talish: *Accipiter gentilis*, *Buteo buteo*, *Aquila chrysaetos*, *Aegypius monachus*, *Gyps fulvus*, *Columba palumbus*, *Dendrocopos syriacus*, *D. minor*, *Coloeus monedula*, *Troglodytes troglodytes*, *Prunella modularis*, *Regulus regulus*, *Turdus philomelos*, *Erithacus rubecula*, *Aegithalos caudatus*, *Parus major*, *Periparus ater*, *Tichodroma muraria*, *Certhia familiaris*, *Chloris chloris*, *Spinus spinus*, *Linaria cannabina*, *Coccothraustes coccothraustes*, *Emberiza cia*;

The species descended the Lankaran plain from the the high mountain belt of Talish: *Accipiter gentilis*, *Buteo rufinus*, *Aquila chrysaetos*, *Aegypius monachus*, *Gyps fulvus*, *Dendrocopos syriacus*, *Coloeus monedula*, *Tichodroma muraria*, *Linaria cannabina*, *Emberiza cia*;

The species descended the mountain-forest belt of Talish from the high mountain belt of Talish: *Turdus torquatus*, *Pyrrhula pyrrhula*.

The characteristic sedentary bird populations determined by us on vertical zonation in the research area are given as following: 14 species (*Podiceps nigricollis*, *Ardea alba*, *A. cinerea*, *Haliaeetus albicilla*, *Circus aeruginosus*, *Francolinus francolinus*, *Porphyrio porphyrio*, *Spilopelia senegalensis*, *Alcedo atthis*, *Corvus frugilegus*, *Cettia cetti*, *Panurus biarmicus*, *Remiz pendulinus*, *Passer hispaniolensis*) for the Lankaran plain, 4 species (*Phasianus colchicus*, *Dryocopus martius*, *Turdus viscivorus*, *Poecile hyrcanus*) for the mountain-forest belt of Talish, 10 species (*Gypaetus barbatus*, *Alectoris chukar*, *Perdix perdix*, *Eremophila alpestris*, *Anthus spinoletta*, *Pyrrhocorax pyrrhocorax*, *Prunella collaris*, *Montifringilla nivalis*, *Serinus pusillus*, *Linaria flavirostris*) for the high mountain belt of Talish.

In the South-Eastern region of Azerbaijan, *Gypaetus barbatus* the least met according to its number settles in the high mountain belt

of Talish. The most met *Passer domesticus* was noted in the Lankaran plain and both in the mountain-forest and high mountain belts of Talish.

In the open dry areas of the Lankaran plain, the most species number is 41 species in the Gizilaghaj State Nature Reserve. In the reednesses and surrounding with the open wetlands, the most species number was 10 species in each of the Small Gizilaghaj gulf and water meadows (Khazar water meadow, Agusha water meadow, Pirman port), and the least species number was 9 species in the Big Gizilaghaj gulf. In the settlements, the most species number was 31 species in the Mamusta area of Lankaran, and the least species number was 22 species in the Khazar village area (39°00'37" N. 48°46'27" E.) of Masalli. In the Lankaran plain, the species we met the most is *Passer domesticus*, and the species we met the least is *Aguila chrysaetos*.

In the mountain-forest belt of Talish, in Astara, the most species number was 50 species both in the Zungulash (38°27'16" N. 48°47'10" E.) and Tangarud (38°34'48" N. 48°49'06" E.) villages of, and the least species number was 46 species in the Palikash (38°31'21" N. 48°39'16" E.) village. In Lankaran, the most species number was 49 species in the Rvo (38°43'05" N. 48°45'11" E.) village, and the least species number was 42 species in the Osakucha (38°45'41" N. 48°40'21" E.) village. In Lerik, the most species number was 51 species in the Dillavu village, and the least species number was 46 species in the Babagil (38°48' N. 48°31' E.) village. In Masalli, the most species number was 43 species in the Tukla (38°52'30" N. 48°40'22" E.) village, and the least species number was 40 species in the Godman (38°58'35" N. 48°37'37" E.) village. In the mountain-forest belt of Talish, the species we met the most is *Chloris chloris*, and the species we met the least is *Aguila chrysaetos*.

In the high mountain belt, the most species number was 35 species in the channel of Zuvandchay and foothills surrounding it. The least species number was 24 species in the Nigis Castle Mountain. In the high mountain belt, the species we met the most is *Passer domesticus*, and the species we met the least is *Accipiter gentilis*.

## CHAPTER VI. THE NATURAL AND ANTHROPOGENIC FACTORS AFFECTING THE SEDENTARY BIRD POPULATIONS IN THE SOUTH-EASTERN REGION OF AZERBAIJAN

In the Lankaran plain, the species affected the anthropogenic influences (the hunted by the human) the most - *Francolinus francolinus*, *Porphyrio porphyrio*, *Columba livia*, *Streptopelia decaocto*, *Spilopelia senegalensis*, *Galerida cristata*, *Melanocorypha calandra*, *Corvus frugilegus*, *Passer domesticus*, *P.hispaniolensis*, *P.montanus*.

Our latest researches shows that the anthropogenic factors mostly affect the species settled in the Lankaran plain. Because in the Lankaran plain, the most of the birds gather to the selitep fields and agroecosystems. The agricultural activities carried out in the area, the change of the soil and vegetation affect seriously them.

In the Lankaran plain, the birds with a positive reaction to the anthropogenic factors are *Streptopelia decaocto*, *Spilopelia senegalensis*, *Spinus spinus*, *Carduelis carduelis*. It was determined that the following species are more seriously exposed to the anthropogenic factors in the Lankaran plain: *Ardea alba*, *A.cinerea*, *Circus aeruginosus*, *Accipiter gentilis*, *Buteo rufinus*, *B.buteo*, *Aquila chrysaetos*, *Haliaeetus albicilla*, *Gypaetus barbatus*, *Aegypius monachus*, *Gyps fulvus*, *Alectoris chukar*, *Francolinus francolinus*, *Perdix perdix*, *Phasianus colchicus*, *Porphyrio porphyrio*, *Columba palumbus*, *C.oenas*, *C.livia*, *Melanocorypha calandra*, *Turdus philomelos*, *Athene noctua*.

The birds like *Accipiter gentilis*, *Dryocopus martius* only like natural dense forest, they don't even like fully developed artificial forest. Although it has a positive effect to the birds such as *Columba livia*, *Streptopelia decaocto*, *Spilopelia senegalensis*, it is harmful as a result of the various human-caused fire events, including the burning of the weed jungle. The numerous and ordinary species are able to regulate their numbers, and the serious decrease cases of them have not been noted. The settlements and other constructions attract the petrophilous birds, parks and forest areas dendrophilous species, perennial tea, grape plantations the various bush birds mainly belong

ging to the *Passeriformes* order as optimal biotopes.

The main sedentary birds of hunting importance in the Lankaran plain: *Francolinus francolinus*, *Porphyrio porphyrio*, *Columba livia*, *Streptopelia decaocto*, *Spilopelia senegalensis*, *Galerida cristata*, *Melanocorypha calandra*, *Corvus frugilegus*, *Sturnus vulgaris*, *Passer domesticus*, *P.hispaniolensis*, *P.montanus*.

In the South-Eastern region of Azerbaijan, the population takes care of the sedentary birds - *Streptopelia decaocto*, *Spilopelia senegalensis* that have a positive reaction to the anthropogenic factors, they do not touch their nests, they protect them as much as possible, and they also feed them during the harsh winter months. According to our researches, the birds with the most negative reactions to the anthropogenic factors in the region as a whole are the followings: *Ardea alba*, *A.cinerea*, *Circus aeruginosus*, *Accipiter gentilis*, *Buteo rufinus*, *B.buteo*, *Aguila chrysaetos*, *Haliaeetus albicilla*, *Gypaetus barbatus*, *Aegypius monachus*, *Gyps fulvus*, *Alectoris chukar*, *Francolinus francolinus*, *Perdix perdix*, *Phasianus colchicus*, *Porphyrio porphyrio*, *Columba palumbus*, *C.livia*, *Athene noctua*, *Passer hispaniolensis*. The expansion of the irrigation network, the creation of the water reservoirs, the creation of the new rice fields, and the formation of the new fish breeding farms had a positive effect to the wetland and coastal birds (For example, *Ardea alba*, *A.cinerea*, *Circus aeruginosus*, *Panurus biarmicus*, *Remiz pendulinus*, *Emberiza calandra*). The formation of the new celiteb fields have affected the following birds: *Ardea alba*, *A.cinerea*, *Accipiter gentilis*, *Buteo buteo*, *Haliaeetus albicilla*, *Columba palumbus*, *Dryocopus martius*, *Dendrocopos major*, *D.syriacus*, *D.minor*, *Lullula arborea*, *Corvus frugilegus*, *C.cornix*, *C.corax*, *Coloeus monedula*, *Prunella modularis*, *Regulus regulus*, *Erithacus rubecula*, *Turdus philomelos*, *T.viscivorus*, *Panurus biarmicus*, *Aegithalos caudatus*, *Poecile hyrcanus*, *Periparus ater*, *Parus major*, *Sitta europaea*, *Passer hispaniolensis*, *P.montanus*, *Fringilla montifringilla*, *Chloris chloris*, *Spinus spinus*, *Carduelis carduelis*, *Linaria cannabina*, *Coccothraustes coccothraustes*. The species which are vulnerable to the deforestation for the area: *Accipiter gentilis*, *Buteo*

*buteo*, *Columba palumbus*, *Bubo bubo*, *Asio otus*, *Picus viridis*, *Dryocopus martius*, *Dendrocopos major*, *D.syriacus*, *D.minor*, *Lullula arborea*, *Prunella modularis*.

In the recent years, the creation of the new rice fields, the conversion of the raw lands to the irrigation and agricultural fields, suppresses the sedentary birds - *Buteo rufinus*, *Galerida cristata*, *Melanocorypha calandra* of the semi-desert and steppe areas.

In the research area, *Picus viridis*, *Dryocopus martius*, *Dendrocopos major*, *D.syriacus*, *D.minor*, *Sitta europaea*, *S.neumayer*, *Parus hyrcanus*, *P.ater*, *P.major* spend the night in the tree shelters. *Garrulus glandarius*, *Pica pica*, *Pyrrhocorax pyrrhocorax*, *Coloeus monedula*, *Corvus frugilegus*, *C.cornix*, *C.corax* spend the night mainly on the top layer of the trees, in the coastal ravines. For these birds, in addition to the protection from the cold, there is also the protection danger from the night predators.

*Corvus cornix*, *Pica pica*, etc. from the sedentary species preying by taking the poultry chicks from the backyards. For the Southern region, the ideas that there will be death in the yard where the owl comes among the people causes to their merciless destruction, too. Thousands of the individuals of *Passer hispaniolensis*, *P.montanus* damage to the grain crops, *Corvus frugilegus*, *Corvus cornix*, *Pica pica* damage by removing the grain sprouts. The doves, swallows and the other birds pollute the human buildings with their excreta and damage their quality. Those that feed with the carrion from the birds of prey are the natural sanitariums. In the South-Eastern region of Azerbaijan, the species most affected are included in the *Falconiformes* and *Strigiformes* orders, many species of the important hunting birds are included in the *Galliformes* and *Gruiformes* orders.

In the South-Eastern region of Azerbaijan, the most species of the birds, especially the species belonging to the *Falconiformes* and *Strigiformes* orders, are influenced strongly by the humans. The nesting and feeding places of these birds have undergone both positive and negative changes due to the anthropogenic influences.

## **CHAPTER VII. THE CONSERVATION WAYS AND IMPORTANCE OF THE SEDENTARY BIRDS IN THE SOUTH-EASTERN REGION OF AZERBAIJAN**

The abiotic, biotic and anthropogenic factors affected the sedentary bird populations in the South-Eastern region of Azerbaijan are different depending on the area where the bird settles and its bioecological characteristics.

In the region conducted the research, the sedentary species which is met very rare in nature is *Phasianus colchicus* (its met place on the border with Iran, the Zungulash, Palikash, Bursulum, Babagil, Dillavu villages). There is no bird species that is extinct or deprived of the breeding, just that the number of the individuals of the species has decreased. But as a result of the anthropogenic influence, some populations of the birds are deprived of the reproduction or wintering. In Azerbaijan, no bird species has become extinct due to the influence of the anthropic factors. The reason that is the birds are far away from the anthropic factors, is that their adaptation is successful. In this respect, the leaving the area of the birds with the flying gives more advantage them over the other vertebrates. So, compared to other vertebrates, the birds can save from danger in time due to their fly ability. The local traditions also play a role in the bird hunting. For example, although the dove is considered a common hunting bird in the research area, it is considered a sacred bird in the Kur-Araz plain.

In the South-Eastern region of the Republic of Azerbaijan, the most influencing factor the sedentary birds is the natural enemies (the birds of prey, the mammals of prey, etc.), and the least influencing factor is the cattle factor (anthropogenic factor).

As shown from the following table, 10 species of the sedentary birds in the research region are included to the II edition of the "Red Book" of Azerbaijan (2013), and 2 species to the International Union for Conservation of Natures Red List (*IUCN Red List*) (Table 7).



**Table 7**

**The current state of the sedentary birds included to the second edition of the "Red Book" of Azerbaijan (2013) and the International Union for Conservation of Natures Red List (*IUCN Red List*) in the South-Eastern region of Azerbaijan**

№	Species	The sedentary bird species included to the second edition of the "Red Book" of Azerbaijan (2013)			The sedentary bird species included to the International Union for Conservation of Natures Red List ( <i>IUCN Red List</i> ) ( <i>NT</i> - near threatened)		
		In the Lankaran plain	In the mountain-forest belt of Talish	In the high mountain belt of Talish	In the Lankaran plain	In the mountain-forest belt of Talish	In the high mountain belt of Talish
1.	<i>Haliaeetus albicilla</i>	+					
2.	<i>Accipiter gentilis</i>	+	+	+			
3.	<i>Buteo rufinus</i>	+		+			
4.	<i>Aquila chrysaetos</i>	+	+	+			
5.	<i>Gypaetus barbatus</i>			+			+
6.	<i>Aegypius monachus</i>	+	+	+	+	+	+
7.	<i>Gyps fulvus</i>	+	+	+			
8.	<i>Francolinus francolinus</i>	+					
9.	<i>Perdix perdix</i>			+			
10.	<i>Porphyrio porphyrio</i>	+					
Total		8	4	7	1	1	2

Table 7 shows that 8 species of the birds settled in the Lankaran plain are included to the second edition of the "Red Book" of Azerbaijan (2013), and 1 species to the International Union for Conservation of Natures Red List (*NT* - near threatened); 4 species of the

sedentary birds in the mountain-forest belt of Talish to the second edition of the "Red Book" of Azerbaijan (2013), and 1 species to the International Union for Conservation of Natures Red List (*NT* - near threatened); 7 species of the sedentary birds settled in the high mountain belt of Talish to the second edition of the "Red Book" of Azerbaijan (2013), and 2 species to the International Union for Conservation of Natures Red List (*NT* - near threatened) and protected.

## RESULT

1. There are 79 species of the sedentary birds belonging to 64 genera, 28 families and 10 orders in the South-Eastern region of Azerbaijan [4, 8, 9].
2. In the South-Eastern region of Azerbaijan, 4 species of the sedentary birds are night birds, 2 species are twilight birds, 73 species are daytime birds, 36 species are zoophagus, 31 species are euryphages, 12 species are phytophages, according to the ecological group, 11% are limnodophilous, 25% are petrophilous, 1% is a synanthropic, 51% are dendrophilous, 4% are eurytopians, 30 species are not a synanthrope, 6 species are incomplete synanthropes, 5 species are complete synanthropes, 4 species are partial synanthropes, 34 species are tropic synanthropes. 50 species of the sedentary birds nest in the open condition, 17 species in the covered condition, 12 species in the open-covered condition, 5% are matures, 90% are immatures, 5% are intermediates species, 84% are in pairs, 15% form colonies, and 1% form pairs and groups [3, 4, 6, 8, 9].
3. For the first time, it has been studied that 58 species of the sedentary birds belong to 10 orders, 26 families, 49 genera in the Lankaran plain, 54 species belong to 6 orders, 20 families, 45 genera in the mountain-forest belt of Talish, and 35 species belong to 6 orders, 16 families, 32 genera in the high mountain belt of Talish according to the vertical zonation of the research area [2, 4, 5, 7, 8, 9].
4. 14 species (*Podiceps nigricollis*, *Ardea alba*, *A.cinerea*, *Haliaeetus albicilla*, *Circus aeruginosus*, *Francolinus francolinus*, *Porphyrio porphyrio*, *Spilopelia senegalensis*, *Alcedo atthis*, *Corvus frugilegus*, *Cettia cetti*, *Panurus biarmicus*, *Remiz pendulinus*, *Passer hispanio-*

*lensis*) are characteristic sedentary species for the Lankaran plain, 4 species (*Phasianus colchicus*, *Dryocopus martius*, *Turdus viscivorus*, *Poecile hyrcanus*) for the mountain-forest belt of Talish, and 10 species (*Gypaetus barbatus*, *Alectoris chukar*, *Perdix perdix*, *Eremophila alpestris*, *Anthus spinoletta*, *Pyrrhocorax pyrrhocorax*, *Prunella collaris*, *Montifringilla nivalis*, *Serinus pusillus*, *Linaria flavirostris*) for the high mountain belt of Talish [3, 4, 6, 7, 8, 9, 10].

5. 26 species (*Buteo buteo*, *Columba palumbus*, *Streptopelia decaocto*, *Bubo bubo*, *Asio otus*, *Strix aluco*, *Picus viridis*, *Dendrocopos major*, *D. minor*, *Galerida cristata*, *Garrulus glandarius*, *Pica pica*, *Troglodytes troglodytes*, *Prunella modularis*, *Regulus regulus*, *Turdus philomelos*, *Erithacus rubecula*, *Aegithalos caudatus*, *Parus major*, *Periparus ater*, *Sitta europaea*, *Certhia familiaris*, *Passer montanus*, *Chloris chloris*, *Spinus spinus*, *Coccothraustes coccothraustes*) were noted in the Lankaran plain and mountain-forest belt of Talish, 1 species (*Buteo rufinus*) in the Lankaran plain and high mountain belt of Talish, 7 species (*Lullula arborea*, *Corvus corax*, *Cinclus cinclus*, *Turdus torquatus*, *Sitta neumayer*, *Petronia petronia*, *Pyrrhula pyrrhula*) in the mountain-forest and high mountain belts of Talish, 17 species (*Accipiter gentilis*, *Aquila chrysaetos*, *Aegyptius monachus*, *Gyps fulvus*, *Columba livia*, *Athene noctua*, *Dendrocopos syriacus*, *Melanocorypha calandra*, *Corvus cornix*, *Coloeus monedula*, *Tichodroma muraria*, *Passer domesticus*, *Fringilla coelebs*, *Carduelis carduelis*, *Linaria cannabina*, *Emberiza calandra*, *E. cia*) were noted on all three vertical zones in the Lankaran plain, mountain-forest and high mountain belts of Talish [4, 7, 8, 9].

6. Due to the seasonal displacement during the wintering period in the Lankaran plain - 18 species are endangered, 26 species rare, 11 species ordinary, 3 species numerous, during the reproduction period - 8 species are endangered, 11 species rare, 8 species ordinary, 6 species numerous. In the mountain-forest belt of Talish, due to the seasonal displacement during the wintering period - 8 are rare, 17 ordinary, 29 numerous, and during the reproduction period - 8 are rare, 11 ordinary, and 33 numerous. In the high mountain belt,

due to the seasonal displacement during the wintering period - 6 species are endangered, 15 species rare, 11 species ordinary, 3 species numerous, during the reproduction period - 2 species are endangered, 9 species rare, 15 species ordinary, 9 species numerous [1, 4, 7, 8, 9].

## PRACTICAL PROPOSALS

1. It should be taken the additional measures by the Ministry of Ecology and Natural Resources of the Republic of Azerbaijan for the feeding, provision with the food and shelter, etc. of the rare and endangered birds (*Gypaetus barbatus*, *Anthus spinoletta*, *Montifringilla nivalis*) during the wintering period in the high mountain belt of Talish.
2. The strengthening of the awareness raising activities should be done for the protection of the birds (*Haliaeetus albicilla*, *Accipiter gentilis*, *Buteo rufinus*, *B.buteo*, *Aquila chrysaetos*, etc.) known "harmful" and destroyed them.
3. The threat creation to *Aquila chrysaetos*, *Bubo bubo* and the other characteristic forest birds should be taken into account by the passage of high-voltage power lines in the forest massif.
4. The booklets and posters about the species (*Haliaeetus albicilla*, *Accipiter gentilis*, *Buteo rufinus*, *Aquila chrysaetos*, *Gypaetus barbatus*, *Aegypius monachus*, *Gyps fulvus*, *Francolinus francolinus*, *Perdix perdix*, *Porphyrio porphyrio*) included in the "Red Book" of Azerbaijan and the Red List of the International Union for Conservation of Nature (*IUCN Red List*) should be prepared and preached among the schoolchildren and other sections of the population.
5. As a result of the intensive anthropogenic transformation (the tourism and recreation centers, road construction, cattle grazing, illegal bird hunting, the increasing of the farms, etc. factors) of the Lankaran lowland and its bordering areas, the gradual reduction of the habitats and food base of the sedentary birds (*Podiceps nigricollis*, *Accipiter gentilis*, *Buteo rufinus*, *B.buteo*, *Aguila chrysaetos*, *Haliaeetus albicilla*, *Gyps fulvus*, *Francolinus francolinus*, *Porphyrio porphyrio*, *Columba palumbus*, *Streptopelia decaocto*, *Spilopelia*

*senegalensis*, *Bubo bubo*, *Asio otus*, *Athene noctua*, *Strix aluco*, *Alcedo atthis*, *Picus viridis*, *Dendrocopos major*, *D.syriacus*, *D.minor*, *Garrulus glandarius*, *Pica pica*, *Coloeus monedula*, *Corvus cornix*, *Troglodytes troglodytes*, *Prunella modularis*, *Cettia cetti*, *Regulus regulus*, *Erithacus rubecula*, *Turdus philomelos*, *Aegithalos caudatus*, *Parus ater*, *P.major*, *Sitta europaea*, *Tichodroma muraria*, *Certhia familiaris*, *Spinus spinus*, *Coccothraustes coccothraustes*) in order to prevent the negative affects to more vulnerable and fewer species to the threats, the counting and nesting places of them should be taken under control by the Ministry of Ecology and Natural Resources of the Republic of Azerbaijan.

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