Fauna, ecology, and protection of birds in the vicinity of Meryasovo village, Baymasky district, republic of Bashkortostan of the Russian Federation

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Abstract. Avifauna is of great importance in anthropogenic, natural biocenoses. In order to regulate and protect them, it is necessary to investigate firstly the composition of the ornithofauna, secondly the specific distribution, and thirdly the population activity of the species composition. We studied the spatial and temporal structure of the avifauna in the vicinity of the village of Meryasovo in the Baymasky district. We have identified 34 bird species belonging to 10 orders and 22 families in the vicinity of Meryasovo, Baimasky district of the Republic of Bashkortostan. The conducted measures to preserve the bird habitats and territories with the main conditions for birds as breeding sites, stopping-off points during migration, wintering, moulting have contributed to the conservation of the bird fauna in the vicinity of Meryasovo village, Baymasky district of the Republic of Bashkortostan.

1 Introduction

Birds participate in all food chains and also remain, in classic style, an integral part of ecological systems and show some influence on them [1]. Avifauna is of no small importance in anthropogenic, natural biocenoses. They play an economic, aesthetic and cultural role for the human ecosystem. In order to regulate and protect them, it is necessary to study: firstly, the composition of the ornithofauna, secondly, the specificity of distribution, and thirdly, the population activity of the species composition. [3]. In the territory of the Republic of Bashkortostan 288 species have been recorded at different time stages, of which 216 are permanently or rarely nesting, 43 occur with varying regularity during spring and autumn migrations, and 29 are described as migrants from other regions [2].

The first attempts to systematize animals, including birds, were made by Aristotle in the 4th century BC. The Greek scientist in his works «On the Parts of Animals» and «On the Origin of Animals» singles out all the birds known to him into the «highest genus» and

gives them the name Ornithes. Although this system was flawed, it was used until the second half of the 17th century. Until the first half of the 18th century, scientists Francis Willoughby and John Ray were engaged in this issue. The basis for the classification of birds was laid by Karl Linnaeus in his teaching «The System of Nature» (1758). In this work, K. Linnaeus introduced the concepts used in the designation of species, hierarchical category and binomial nomenclature. According to this taxonomy, birds (Aves) occupied one class of the six major classes [4].

Aware of the importance of studying the avifauna of the Baymak district of the Republic of Bashkortostan, we set a goal – to analyse the composition of the avifauna in the vicinity of the village of Meryasovo, Baymak district of the Republic of Bashkortostan. To achieve our goal, we carried out the following tasks: developing a route to study avifauna; leaving a description of the species composition of birds; assessing the species diversity of birds at different sites; determining the high degree of similarity of the species composition, identifying background species in the study route.

2 Materials and Methods

Subject: Species composition of the avifauna in the vicinity of the village of Meryasovo, Baimaksky district of the Republic of Bashkortostan in 2018-2019.

To study the species composition of the avifauna in the vicinity of the village Meryasovo, Baymaksky district of the Republic of Bashkortostan three study sites were established.

1st place of research. Geographical position: the village of Meryasovo is located southeast of the center of the Baymak region - the city of Baymak. The nature of the village's surroundings is unique with its rich picturesque landscape, ridges of bizarre hills and mountains. A road passes through the village of Meryasovo along the Baimak - Tubinsk route. Also, near the village, there are roads along the route Meryasovo - Baymak, Bakhtigareevo - Baymak. Flora and fauna: vegetation is represented by woody and herbaceous formations. Forests are mainly small-leaved and coniferous - birch, spruce, larch. Shrub vegetation (wild rose, raspberry, steppe cherry) is widespread in the floodplains of the rivers. Forb-fescue steppe. The fauna of forests is diverse, there are squirrels, foxes, hedgehogs, etc. The uniqueness of the village of Meryasovo lies in the fact that inside the village there are small rivers located at the foot of Mount Irendyk, which is to the west of the village of Meryasovo: Malaya Korsaga and Akmendy.

2nd place of research. The route started from the village of Meryasovo, then headed to the Grafskoye River, located 0.5 km from the end of the village.

The third route passed along the Irendyk ridge. The Tanalyk River is located nearby the Baymak district. A large number of migratory waterfowl, sedentary bird species can be found here. The area was studied in the early morning from March 30, 2018, to September 30, 2019.

The avifauna was studied in terms of appearance, flight characteristics, and voices. When studying the avifauna, we used the bird guides of the authors: Valuev, V.A., 2009 Ryabtsev, V.K., 2012, Khrabryi, V.M., 2006 [3, 7, 8]. We also considered the ecological and physiological features of birds according to the author Ilyichev, V.D., 1982; features of bird nesting according to Mikheev, A.V., 1996 [5, 6, 9]. To accurately determine whether it belongs to a particular species, you need to find a couple of the most specific signs of its appearance, and there are few such properties. Established terminology was required during the desk processing of research data on the study of avifauna. In flight conditions, we analyzed only large details of the avifauna [5].

3 Results and Discussion

We have accumulated a large volume of research material during our expedition from 2018 to 2019. To study the avifauna at dawn, we recorded the songs of the birds on a voice recorder and took photographs. Every day, in the early morning, we carried out avifaunistic exploration in different places in the vicinity of the village of Meryasovo, Baimaksky district, and recorded the results into the diary.

The study of the spatial and temporal structure of the avifauna in the vicinity of the village of Meryasovo, Baimaksky district, made it possible to find 34 bird species belonging to 10 orders – Passeriformes, Columbiformes, Piciformes, Cuculiformes, Apodiformes, Strigiformes, Podicipediformes, Ciconiiformes, Anseriformes, Podicipediformes, Charadriiformes, Coraciiformes; 22 families – Corvidae, Ploceidae, Muscicapidae, Paridae, Columbidae, Sylviidae, Motacillidae, Picidae, Sturnidae, Anatidae, Hirundinidae, Alaudidae, Bombycillidae, Fringillidae, Cuculidae, Apodidae, Strigidae, Ardeidae, Podicipedidae, Laridae, Meropidae, Scolopacidae (Table. 1).

Table 1. Species composition of birds in the village of Meryasovo, Baimaksky district

Name of the order, family, type	Research sites		
	Point 1	Point 2	Point 3
Order Passeriformes			
Family Corvidae			
Pica pica	captured		
Corvus corax	Captured		
Corvus monedula	Captured	captured	captured
Family Paridae			
Parus major		captured	captured
Parus montanus	Captured	captured	
Family Ploceidae			
Passer domesticus	Captured		
Passer montanus		captured	captured
Family Motacillidae			
Motacilla alba	Captured		captured
Motacilla flava	Captured		captured
Family Hirundinidae			
Hirundo rustica		captured	
Family Alaudidae			
Alauda arvensis		captured	captured
Family Sturnidae			
Sturnus vulgaris		captured	
Suborder Passeri Songbird			
Family Sylviidae			
Sylvia borin	Captured		captured
Sylvia communis	Captured		captured
Family Muscicapidae			
Phoenicurus phoenicurus		captured	
Ficedula hypoleuca		captured	
Ficedula parva		captured	captured
Family Bombycillidae			
Bombycilla garrulus	Captured		

Table 1. Continued

Family Fringillidae			
Pyrrhula pyrrhula	Captured		
Order Piciformes			
Family Picidae			
Dendrocopos major	Captured	captured	captured
Picoides minor			captured
Отряд Cuculiformes			
Family Cuculidae			
Cuculus canorus	Captured	captured	captured
Отряд Columbiformes			
Family Columbidae			
Columba livia	captured		
Order Apodiformes			
Family Apodidae			
Apus apus	Captured		captured
Order Strigiformes			
Family Strigidae			
Strix aluco			captured
Order Ciconiiformes			
Family Ardeidae			
Ardea cinerea		captured	
Order Anseriformes			
Family Anatidae			
Cygnus olor			captured
Aythya ferina		captured	
Order Podicipediformes			
Family Podicipedidae			
Podiceps cristatus		captured	
Order Charadriiformes			
Family Laridae			
Chroicocephalus ridibundus		captured	
Family Scolopacidae			
Tringa totanus		captured	
Order Coraciiformes			
Family Meropidae			
Merops apiaster		captured	
Total:	16	17	15

The ability of birds to adapt to different habitat conditions determines the appearance of ecological groups. Each group, which adapts to certain living conditions; uses their characteristic feeds and has established adaptations for their extraction. Most of the birds - 31% in the study areas coexist close to human dwellings, since it is easier to find food and a place for nesting. The second place in the ecological niche is occupied by forest birds - 27%. (Table 2).

Table 2. Ecological groups of birds by habitat

Habitat	Groups
Forest birds	Common cuckoo, gray-headed woodpecker, wood grouse, common magpie, common raven, common nightingale.
Birds of open spaces	Обыкновенный скворецCommon starling, yellow wagtail, field sparrow
Waterfowl birds	Mute swan, great toadstool, red-headed duck
Birds of coasts, reservoirs, swamps	Серая Gray heron, barn swallow, common nightingale, common starling
Urban (rural)	House sparrow, field sparrow, common nightingale, common starling, white wagtail, yellow wagtail, rock dove

The avifauna is unevenly distributed in biotopes: according to the route registration, the maximum diversity of bird species (17 species) was recorded near Lake Grafskoe, which is due to the abundance of food and diverse conditions for nesting. 16 species have been recorded in the vicinity of the village of Meryasovo. The smallest number - 15 bird species - was recorded near the Tanalyk River.

The birds of point 2 in the area of Lake Grafskoye and point 3 in the area of the Tanalyk River of the Baymak district of the Republic of Bashkortostan have a large degree of similarity of the avifauna. We believe that birds migrate from one place to another for the purpose of exploration and search for food. Point 1 of the village of Meryasovo of the Baymaksy district of the Republic of Bashkortostan has a lesser degree of similarity.

The background species in the settlement included the rook and the dove, and the prevailing species included common crow, house sparrow. The background and dominant species include almost the same species of birds in the area near Lake Grafskoe and the Tanalyk River. The primary threats to the water resources of the village of Meryasovo and its environs are the annual decrease in water, or rather shallow water. Important reasons include grazing on the banks of rivers, haymaking, and groundwater abstraction. It is also characterized by a powerful shallowing of the Tanalyk River due to the fact that the development of placer gold deposits began near the village of Meryasovo, 4-5 kilometers from the city of Baymak. The threats listed above have worsened the ecological situation, and we believe that in the future this may affect the local avifauna of birds. It should also be noted that the above does not guarantee the actual protection of the local birds and plants. Rare bird species of the Meryasovo village include the great egret and mute swan. A peculiar place in the fauna of the Meryasovo village of the Baymaksy region is occupied by birds that flock to Lake Grafskoye.

We have carried out the following measures for the protection of birds: protection of breeding conditions, migration paths, habitats; obtaining bans on catching birds, on ruining bird nests, on collecting eggs, on scaring birds. We also carried out the following activities to attract birds: preparing feed, installing attractive feeders, hanging nesting sites; attracting birds to settlements, vegetable gardens, forest resources, reservoirs and fields.

4 Conclusion

Thus, the avifauna of the Meryasovo village, Baimaksy district, at the present stage is presented as follows: Corvidae, Ploceidae, Muscicapidae, Paridae, Columbidae, Sylviidae, Motacillidae, Picidae, Sturnidae, Anatidae, Hirundinidae, Alaudidae, Bombycillidae,

Fringillidae, Cuculidae. Apodidae, Strigidae, Ardeidae, Meropidae, Podicipedidae, Laridae, Scolopacidae. The background bird species in the investigated Meryasovo village are the rook and the dove, while the common crow and the house sparrow are the predominant species. The birds of point 2 in the area of Lake Grafskoye and point 3 in the area of the Tanalyk River of the Baymak district of the Republic of Bashkortostan have a large degree of similarity of the avifauna. The measures we have taken to preserve the habitat of birds and territories that have the main conditions for birds as nesting places, stopping during migration, wintering, molting, contributed to the protection of avifauna in the Meryasovo village of the Baimaksky district of the Republic of Bashkortostan.

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