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Present status of the great egret (*Egretta Alba* Linn, 1758) in the South-East part of Azerbaijan

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Abstract

The present research was undertaken to study the great egret's distribution, number, feeding stations, and the factors that affect them in the South-Eastern of Azerbaijan during 2013-2016.

For the first time, the feeding stations, the number and the density of the species were determined in the region. The 98.09% of the number of it has inhabited in the Gizilaghaj State Nature Reserve, the 9.25% in the areas apart the reserve. In 1 km² its density was 4.74 individuals in the reserve, but 0.03 individual in the areas apart the reserve. The main reason of the few number of it were grazed a lot of large and small-cattle in the areas apart the reserve. But in the reserve the main reason of the ordinary number of it were the lack of negative impact of the anthropogenic factors, the rich of the feed resources of the open swamps and shallow water areas which were the feeding areas.

Keywords: Great egret, station, number, density, factors, open swamps

1. Introduction

In the first half of the twentieth century, the thousands small wetland areas along in all areas of Kaladahna, Jil, Alkhovka, Mrdov and all the region which were the feeding stations of the great egret were dried and fruit and vegetables (tomato, cucumber, cabbage) and cotton were planted in the South-East of Azerbaijan [18]. But the white feathers (egretta) on the waist of the egret were widely used to decorate the women's caps. Therefore, they were massively hunted. In 1904 a lot of egrets were hunted, 8 kg feathers of the egret were taken only along the coast of the Caspian Sea in the Caucasus. Its number was decreased sharply as a result of the work done [17].

In connection with the mentioned thoughts, the hunting of the great egret and the drying of the wetland biotopes which are the feeding stations were prohibited in Azerbaijan.

Episodic information about the number, the factors that influence it, the feeding stations is given in the existing literature [10, 6, 9, 15, 11], too. The last literature information about these species is connected with its number in the period of the fertility. This information also dates 1977-40 years ago [11] and it was outdated considerably. Only the type composition of food was studied in details [5].

The aim of present research was to discover the distribution on biotopes, the number, the density, the situation of the feed stations of the great egret, the factors that affect them and to prepare scientifically based recommendations for the protection.

2. Materials and Methods

Research were carried out in the feed stations of the great egret (the Gizilaghaj State Nature Reserve 298 km² and the plain areas apart the reserve 3504 km²) in the summer months (July, August) of the 2013-2016. The situation of the feed stations of the great egret, anthropogenic, biotic and abiotic factors influence them has been learnt by observation, but the number has been learnt in the route the width which is not determining.

The category according to the density of population of species was based on to Kuzyakin AP [12] and Mustafayev GT [16]: the population falling 0.1-0.9 individual to the 1 km² area is accepted rare, the population falling 1-9 individuals is accepted ordinary, and the population falling more than 10 individuals to the same to the area is accepted numerous.

Researches has been fulfilled by using the binocular, telescope and the car as a means of assistant.

3. Results and Discussion

It was observed that, the Gizilaghaj State Nature Reserve and the areas apart from it differed sharply from each other for the ecological features the great egret was distributed unequally in them.

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3.1 The Gizilaghaj State Nature Reserve: As seen from the Table 1, 98.09% of the total number of the great egret in the areas of research had inhabited in the Gizilaghaj State Nature Reserve. The density of the great egret was 4.74 individuals in the 1 km² here, that was ordinary. The main feeding station in the territory of the reserve consist of open swamps, the coastal water of the water basins (5-10 cm) and the open dry areas. Open swamps are located in the North-East and South-Western parts of the coastline of the Greater Gizilaghaj bay, in the Northern and Southern coastline of the Smaller Gizilaghaj bay, shallow water areas and open swamps are in the Pirman port, in different places of the water meadow of the Caspian and Aghgush. Open swamps in the coastline of the bays have been separated by the dense reed (*Phragmites*) and giant cane (*Arundo donax*) jungles in the width which is 10-500 m. The main food of the great egret consists of the social vole (*Microtus socialis*) from the mammals, the dice snake (*Natrix tessellata*) from the reptiles, the marsh frog (*Pelophylax ridibundus*) from the amphibians, the Caspian roach (*Rutilus rutilus caspicus*), the common carp (*Cyprinus carpio*), the stickleback (*Pungitius*), the Western mosquitofish (*Gambusiya affinis*), the bullhead (*Neogobius*) from the fishes, the larvae of the odonata from the dragonflies (*Anisoptera*) suborder from the invertebrates in Azerbaijan. According to the sources in literature, *Natrix tessellata* [3] and *Pelophylax ridibundus* [4] are numerous species on the shores of the Caspian. In 50 m² we registered on average 92 individuals *Natrix tessellata*, 128 individuals *Pelophylax ridibundus* in the coastline of the Greater Gizilaghaj bay, but 98 individuals *Pelophylax ridibundus*, 83 individuals *Natrix tessellata* in the coastline of the Smaller Gizilaghaj bay in 2013-2016. In 50 m² we registered 298 *Pelophylax ridibundus*, 109 *Natrix tessellata* in the open swamps of the Pirman port, water meadow of the Caspian and Aghgush which are connected by two channels with the Greater

Gizilaghaj bay and organizing the whole system. But in the open shallow waters the present study observed the big number groups of the *Rutilus rutilus caspicus*, *Cyprinus carpio*, *Cobitis*, *Pungitius*, *Gambusiya affinis* and *Neogobius*. The fish species that noted were numerous in the water basins of the Gizilaghaj State Nature Reserve also according to the literature sources [13]. Being rich in fish species of the these sweet water basins was connected with the mass spawn from Greater Gizilaghaj bay by main and water flowing canal.

In 2013-2016 the great egret's total number was 322.5 on average, the density 10.75 individuals in 1 km² in the open swamps of the coastline of the Greater Gizilaghaj bay, 188.5, the density 10.47 individuals in 1 km² in the open swamps of the Smaller Gizilaghaj bay, 806.75, the density 13.44 individuals in 1 km² in the Pirman port, in the water meadow of the Caspian and Aghgush (Table 1).

The feeding station on land of the great egret lied along of the reserve area with the width of 3-5 km from North to South. It was surrounded by the Greater Gizilaghaj bay from the East, but by the Smaller Gizilaghaj bay, Pirman port, water meadow of the Caspian and Aghgush from the West. Two canals lied across the land area. These channels using shedding into the Greater Gizilaghaj bay accumulated excess water in the Smaller Gizilaghaj bay, provide the fish to cross there for spawn. In 2013-2016 on average the number of the *Pelophylax ridibundus* was 58 individuals in 50 km², but the number of the *Microtus socialis* 190 individuals in the area. *Microtus socialis* was numerous and rapid growth becomes in the number of it periodically in the Gizilaghaj State Nature Reserve, also according to the literature sources [7, 2]. In the present study, the average total number of the great egret was 97.25 individuals, but the density was 0.51 individual in 1 km² in the open dry areas. It was clear that the feed object of the great egret and their resources were sufficient in the Gizilaghaj State Nature Reserve.

Table 1. Number and distribution according to the stations of the great egret (*Egretta alba* Linn, 1758) in the summer season of 2013-2016 in the South-East of Azerbaijan.

The Gizilaghaj State Nature Reserve							
Separate areas	Years	2013	2014	2015	2016	On average	
						The total number	The density
The open swamps, the water areas in the coastline of the Greater Gizilaghaj bay (30 km ²)		309	300	298	383	322.5	10.75
The open swamps in the North-East coastline of the Smaller Gizilaghaj bay (18 km ²)		190	180	166	218	188.5	10.47
The open swamps and the shallow water areas in the Pirman port, in the water meadow of the Caspian and Aghgush (60 km ²)		816	700	706	1005	806.75	13.44
The dry area of the reserve (190 km ²)		100	120	100	69	97.25	0.51
Total (298 km ²)		1415	1300	1270	1675	1415	4.74
The areas apart the Gizilaghaj reserve							
The open swamps in the Smaller Gizilaghaj State Nature Prohibition (11 km ²)		54	11	44	34	35.75	3.25
The open dry areas of Kurdili Island (22 km ²)		41	44	29	18	33	1.5
The open swamps and the shallow coastal waters in the Lankaran coastline of the Caspian Sea (211 km ²)		34	18	23	28	25.75	0.12
The open dry areas (3260 km ²)		28	51	41	36	39	0.01
Total (3504 km ²)		157	124	137	116	133.5	0.03
The total in the investigation territory (3802 km ²)		1572	1000	1407	1791	1442.5	0.37

3.2 The areas apart the reserve: In 2013-2016 9.25% of the total number of the great egret in the area of research has inhabited in the areas apart the reserve. The density of it has been 0.03 individual in the 1 km² (Table 1), that is meets rarely. The open swamps of the feeding stations of the great egret surround the West coastline of the Smaller Gizilaghaj bay, the shallow coastal waters and the complex of the open

swamps surround the Lankaran coastline of the Caspian Sea, open dry areas surround the most part of the Lankaran lowland and the South-East end of the Kur-Araz lowland and the area of Kurdili Island in the areas apart the reserve. Only the open swamps in the West coastline of the Smaller Gizilaghaj bay from noted stations have been rich in feed objects of the great egret. In 2013-2016 it was on average 52

individuals the number of the *Pelophylax ridibundus* and 31 individuals the number of the *Natrix tessellata* in 50 m² of the noted station, 32 individuals the number of the *Pelophylax ridibundus* and 22 individuals the number of the *Natrix tessellata* in the open swamps of the coast and the shallow coastal waters of the Caspian Sea. *Microtus socialis* was numerous in the open dry areas.

In 50 m² we have registered 61 individuals *Microtus socialis*, 32 individuals *Pelophylax ridibundus* in the Lankaran lowland and the South-East end of the Kur-Araz lowland, but 53 individuals *Microtus socialis*, 34 individuals *Pelophylax ridibundus* in Kurdili Island. It was seen clearly that the feed stock of the great egret was very few in the areas apart the reserve.

In 2013-2016 on average the total number of the great egret was 35.75 individuals, the density 3.25 individuals in 1 km² in the swamp of the West coastline of the Smaller Gizilaghaj bay, 25.75 individuals, the density 0.12 individual in 1 km² in the coastline of the Caspian Sea, 39 individuals, the density 0.01 individual in 1 km² in the South-East end of the Kur-Araz lowland, 33 individuals, the density 1.5 individuals in 1 km² in Kurdili Island.

3.3 Trophic factors: The factors affecting the number indexes of the great egret. As stated above, the importance of the feed resources is great as the main trophic factor. But the golden jackal (*Canis aureus*), the grey wolf (*Canis lupus*), the red fox (*Vulpes vulpes*), the jungle cat (*Felis chaus*) from the mammals which settled in the Gizilaghaj reserve are its main natural enemies. The most widely spreading and numerous from them is jackal in the reserve. It is met everywhere (in the open swamps, in the shallow waters, in the dam around the channels) in the reserve, in the reed (*Phragmites*), giant cane (*Arundo donax*), rush (*Juncus L.*), jungles, in the blackberry (*Rubus L.*) jungles in the dry areas and in the open areas. But the main rally (concentration) places are the reed and the giant cane jungles. The number of the jackal is valued 2600 individuals by researchers of the reserve for 2016^[1]. The density of it was 8.7 individuals in 1 km². In the research years we have registered the tracks of the jackal which are in the place where the remains of the 193 individuals bird's body were destroyed. It can be noted that, the 237 bird species settle in the Gizilaghaj State Nature Reserve. More than 2 million birds spend winter here in the favourable climatic conditions. The annual food ration of the jackal consists of the 65.5% of the birds^[14]. The main settled area of the jungle cat was cane and reed jungles, too (189 km²). Its number is valued 38 individuals by researchers of the reserve in 2016^[1]. Its density was 0.2 individual in 1 km². We determined the tracks on the 48 individuals bird's remains body which were destroyed. The red fox has spread widely in the dry area (190 km²) of the reserve. Its number is valued 190 individuals by researchers of the reserve in 2016. Its density was 1 individual in 1 km². We have observed the attack to birds in the investigation years 49 times. 21 of them have resulted successfully. Its annual food ration consists of the 28.2% of the birds^[8]. The grey wolf settles in the open dry area of the reserve. Its number was valued 69 individuals by researchers of the reserve. Its density was 0.3 individual in 1 km². We determined the tracks of the grey wolf around the 12 bird's remains body which were destroyed in 2013-2016.

3.4 Anthropogenic factors: The anthropogenic factors negative influencing to the birds are very strong in the Lankaran lowland and in the open dry areas in the South-East

end of the Kur-Araz lowland in the areas apart the reserve, also in the coastline of the Caspian Sea. The planting areas of the tea, citrus, fruit and vegetables (tomato, cabbage and etc.) which are no importance for living of the great egret are dominated in the most parts of the South and the centre of the Lankaran lowland, the planting areas of the grapes, fruit and vegetables and technical plants in the North and South-East end of the Kur-Araz lowland. It meets in the wheat and barley areas in the separate places. The Baku-Astara railway and highway pass throughout the entire territory. The paved roads, electricity, telegraph, gas lines are going to the all settlements located in the area. The complexes of tractor, car, the bases of fruit and vegetables, cattle-breeding are built in the unplanted territories. A lot of large and small-cattle are grazed. The number of the great egret was very few by negative influence which were noted in the coastal waters of the Caspian Sea and in the open swamps meeting in the separate places borders to it, in 2013-2016 in the noted station the density of the great egret was on average 0.1 individual in 1 km², but in the open dry areas 0.01 individual.

The anthropogenic influences are weak in the open swamps in the West of the Gizilaghaj bay and in the dry open areas of Kurdili Island. Only few large-cattle are grazed in these stations. In the mentioned areas the density of the great egret is more than the other areas. It was 3.25 individuals in 1 km² of the open swamps, but 1.5 individuals in 1 km² of the open dry areas.

4. Conclusion

From the data analysis we can come to the following conclusions:

1. In the South-Eastern part of Azerbaijan in 2013-2016 on average the 98.09 % total number of the great egret has settled in the Gizilaghaj State Nature Reserve, but 9.25% in the areas apart the reserve. The density of the feeding stations in 1 km² in the Gizilaghaj State Nature Reserve was 4.74 individuals, but in 1 km² in the areas apart the reserve 0.03 individual.
2. It has been determined that the feeding stations of the great egret consist of the open swamps, shallow water areas (the depth until 10 cm), raw land and barley sowing areas in the South-Eastern part of Azerbaijan.
3. The main reason of the few number of the great egret are not favourable areas for living of this species and the strongest of the anxiety factors in the areas apart the reserve.
4. In the Gizilaghaj State Nature Reserve the main reason of a lot of number of the great egret is the rich of the feed resources and the lack of negative impact of the anthropogenic factors there.

5. Acknowledgement

It is necessary to implement the following shown measures in order to achieve increase in the number, the stabilization of the ecological situation of the great egret in the South-East of Azerbaijan.

1. The negative impact (drying) of the anthropogenic factors to the open swamps which are the main feeding stations of the great egret in the areas apart the reserve should be minimized.
2. It should not be allowed to expansion of the cane, reed and sedge jungles at the expense of the open swamps in the Gizilaghaj State Nature Reserve.
3. It is necessary pumping the water through the main canal from the Kura river to the same water basins in order to

avoid of the decreasing of the feeding stations as a result of the drying of the shallow water areas and the open swamps impact of the high temperature in summer in the fresh water basins (Pirman port, the water meadow of the Caspian and Aghgush).

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