ASPECTS ON THE BREEDING SEASON OF BIRD FAUNA IN THE ROSPA0074 MAGLAVIT (ROMANIA)

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Abstract. *Our study was carried out from March 2016 to September 2019, within the perimeter of 3 wetlands (Lake Fântâna Banului, Lake Maglavit, and Balta Golenți) as well as in the agricultural, forestry and grassland ecosystems form the Maglavit Special Protection Area. The diversity study of the avian fauna was carried out using occurrence and dominance indices. Another method used was the route method, applied in poplar drifts near the Danube river and in the forest of Maglavit; species heard, encountered, and frequency of meetings were noted in ObsMapp. In this study, we focused on the diversity of breeding birds in the site.. The final list brings together 121 species that have constantly nested within the studied territory and 9 other species with uncertain status in certain years of the monitoring stage (Anser anser, Tadorna tadorna, Chlidonias leucopterus, Recurvirostra avosetta, Caprimulgus europaeus, Ficedula hypoleuca, Aegithalos caudatus , Haliaeetus albicilla, Circus pygargus). At lake Fantana Banului a total of 5982 pairs of birds and 53 species were recorded. At lake Maglavit 36 species of birds were recorded with a total of 1891 pairs. At the habitat Golenți 31 species of birds with a total of 1057 pairs were recorded. At the habitat of -deciduous forest 59 species of birds were recorded with a total of 5584 pairs. At the farmland we recorded 18 species with a total of 1075 pairs. The nesting habitats are in a good state of conservation a fact which has favoured a high consistency in the dynamics and the number of bird populations during the three years of monitoring. However, the tendency of birds to choose areas that can be correlated with a lower anthropic impact has been observed, areas where, in particular, fishing is controlled and fish poaching is almost non-existent.*

Keywords*: bird fauna, breeding, Nature 2000, climate, anthropogenic impact*

INTRODUCTION

Part of the Natura 2000 network (GD no.1284 / 2007), ROSPA0074 Maglavit is located in the continental bioregion on a total area of 3661.30 ha and includes the flood zone of the Danube between the Cetate and Calafat localities of Dolj county, in which there were formed several lakes: Lake Fântâna Banului, Lake Hunia, Lake Maglavit and Lake Golenți.

The predominant morphological character of this sector is the presence of the meadow and the Danube terraces, supplemented by the specific relief of dunes.

The climatic regime encountered in the site is specific to the Oltenia Plain, a temperate continental one, corresponding to the processes of atmospheric circulation, due to its location in south-eastern Europe.

From a limnological point of view, the existence of the natural lakes found on the site is determined by the hydrographic network, which has ensured their origin as well as their evolution over time. In these conditions, on the former Danube course, instead of abandoned or meadow arms, in the Cetate - Calafat sector we find several aquatic basins: Lake Fântâna Banului on an area of 310 ha and a depth of up to 2.6 m which is in present under fishery management; Lake Magavit with an area of 48 ha, with a depth of up to 2.4m and Lake Golenți with an area of 165 ha and a depth of 3.2m, currently being a angling.

Geologically, the area is formed on the morpho-tectonic pattern of the subsequent Severin-Calafat-Bechet depression, which influenced the flow direction and hastened, on the right side, the erosion of the river banks.

The dominant vegetation is that of steppe, the main agricultural crops are made of grass and maize. In the wet areas there are poplar groves and in the perimeter of Lake Maglavit - Lake Golenți there is a compact black locust forest. The surface of the site is dominated by lakes and marshes (half of the territory), deciduous forests (36%), pastures (12%), vineyards and orchards (2%).

Due to its location at a short distance from the Danube the habitats here attract many species of birds, especially the aquatic ones. This area is known for its ornithological importance, as it is located on the most important bird migration corridor in the lower basin of the Lower Danube, halfway between the nesting sites in northern Europe and the wintering shelters in Africa. The area is important during the nesting period as well, because of the diversity and a large number of species found here.

However, the ornithological studies done in the area are few and mostly refer to the last century: CĂTUNEANU (1985), PAPADOPOL (1982, 1984, 1986), TĂLPEANU (1963, 1965, 1972), PASPALEVA (1972), CIOCHIA (2001), MUNTEANU (1991, 2008), PAPP AND FÂNTÂNĂ (2008). Recent studies on the breeding and wintering avian communities were made by MARZLUFF (2017), LEVEAU AND LEVEAU (2016), CAULA ET AL. (2014), WANG ET AL. (2013), NIELSEN ET AL. (2013), MCCLURE ET AL. (2013), MURGUI (2010).

MATERIAL AND METHODS

Our field research regarding the knowledge of the avifauna in the Special Protection Area of Maglavit took place between April 2017 -and November 2019. In this paper the results obtained in the breeding seasons are concentrated, when two trips per month were made.

A wide range of research methods was used for collecting as accurate data as possible, the final objective being to illustrate a detailed bird population picture, as well as the comprehensive counting of aquatic birds: all the aquatic species seen/heard in Lake Fântâna Banului, Hunia Lake, Maglavit Lake, and Golenți Lake were accurately noted. The following methods were used: 1) counting from observation points: it has been used on meadows and agricultural fields for monitoring singing birds and for birds with nocturnal activity; b) counting on observation points for diurnal raptors and corvids; c) observation points with vocal stimulation (playback) for the evaluation of the species with hidden behaviour (birds of prey, quail, partridge) but also for nocturnal species; d) another method used was the route method, applied in poplar drifts near the Danube and in the forest of Maglavit; species heard, encountered, and frequency of meetings were noted in ObsMapp. The latter method was effective because it provided data on the number of nesting species.

The equipment used to facilitate observations was made up of the Collins Bird Identification Guide, Nikon Monarch 7 10x42 binoculars, 7d mark II Canon camera and 150-600mm sigma lens plus the Manfrotto 190X PRO tripod.
In analysing our results, we use the taxonomic system SIBLEY & AHLQUIST (1995) with further additions and modifications (http://avibase.bsc-eoc.org/).

The diversity study of the avian fauna was carried out using occurrence and dominance indices according to Abreu and Nogueira (1989) and Palma (1975). The dominance index of avifauna was calculated by the formula: D (%) = (Na*100)/N, in which Na = the total number of individuals of species found in the investigated samples and N = total number of individuals. The value obtained was classified as: accidental, where species represent 0.0 to 2.5% of total birds; accessory, where species represent 2.6-5.0% of the total birds; and dominant, where species represent 5.1-100% of the total birds.

RESULTS AND DISCUSSIONS

At lake Fântâna Banului a total of 5982 pairs of birds and 53 species were recorded. Regarding the population dynamics, we can observe the difference between the study years. In the year 2017 51 species of birds with a total abundance of 1944 pairs. The maximum number of pairs was recorded in the year 2018, when were recorded 52 species of birds with a abundance of 2193 pairs. The lowest flight intensity took place in the year 2019, when the population is declining, this year is characterized by the fewest birds species with the lowest abundance of individuals 50 species of birds with a total abundance of 1845 pairs.

In this habitat the most abundant species of birds were: *Chlidonias hybridus* with an abundance of 1170 pairs and a dominance of 19.56 % , *Chroicocephalus ridibundus* with an abundance of 540 pairs and a dominance of 9.03 %, *Egretta garzetta* with an abundance of 470 pairs and a dominance of 7.86 %, *Ixobrychus minutus* with an abundance of 460 pairs and a dominance of 7,69 %, and *Merops apiaster* with an abundance of 390 pairs and a dominance of 6,52 % (fig. 1 and 2)

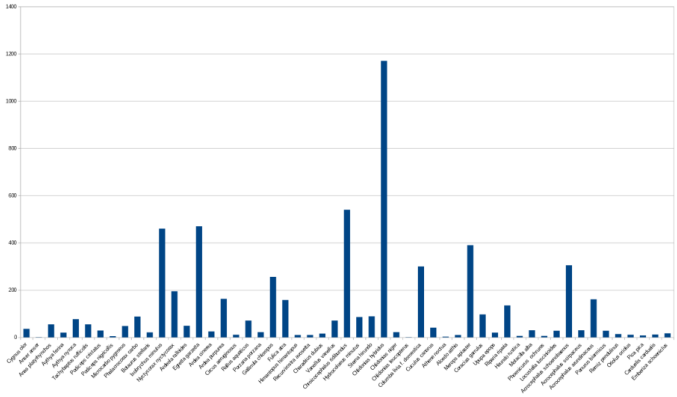

Fig. 1: Abundance of birds species, 2017, 2018, 2019, Lake Fântâna Banului

At Lake Fântâna Banului the dominant species were: *Chlidonias hybridus, Chroicocephalus ridibundus, Egretta garzetta, Ixobrychus minutes, Merops apiaster and Columba livia domestica*. The accessory species were: *Acrocephalus arundinaceus, Gallinula chloropus, Nyctycorax nyctycorax, Fulica atra* and the other species who represent 0.0 to 2.5% was classified as accidental.

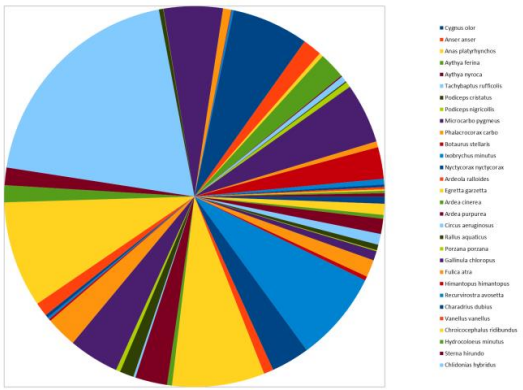

Fig. 2: Dominance of birds species, 2017, 2018, 2019, Lake Fântâna Banului

At lake Maglavit were recorded 36 species of birds with a total of 1891 pairs. Regarding the populations dynamic, we can observe the difference between the years. In the year 2017 were recorded 36 species of birds with a total abundance of 694 pairs. The maximum number of pairs was observed in the year 2018, when were recorded 35 species of birds with a abundance of 747 pairs. In 2019, the population is declining, and is characterized by the fewest birds species with the lowest abundance of individuals 32 species of birds with a total abundance of 690 pairs.

In this habitat the most abundant species of birds were: *Nyctycorax nyctycorax* with an abundance of 370 pairs and a dominance of 19.57-%, *Ardeola ralloides* with an abundance of 243 pairs and a dominance of 12,85, *Chroicocephalus ridibundus* with an abundance of 193 pairs and a dominance of 10.21-% and *Egretta garzetta* with an abundance of 165 pairs and a dominance of 8.73-%. (fig. 3 and 4)

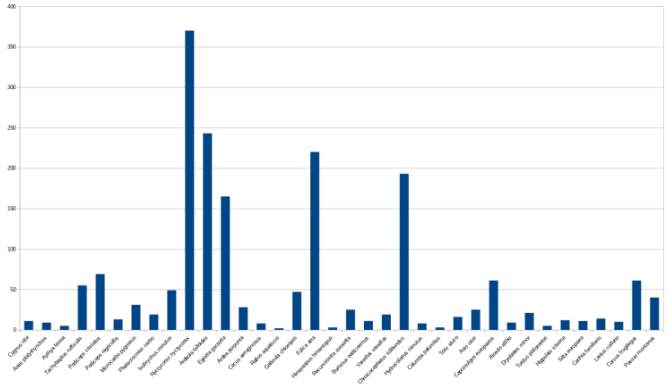

Fig. 3: Abundance of birds species, 2017, 2018, 2019, Lake Maglavit

At Lake Maglavit the dominant species were: *Nyctycorax nyctycorax*, *Ardeola ralloides*, *Chroicocephalus ridibundus*, *Egretta garzetta*. The accessory species were: *Corvus frugilegus*, *Caprimulgus europaeus*, *Ixobrychus minutus*, *Tachybaptus rufficolis*, *Podiceps cristatus* and the other species with values below 2.5-% was classified as accidental.

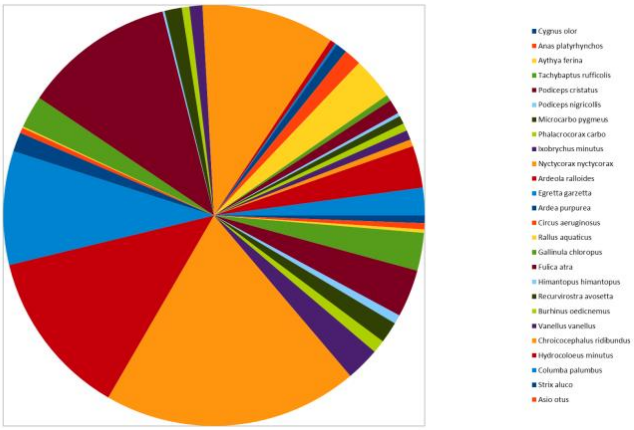

Fig. 4: Dominance of birds species, 2017, 2018, 2019, Lake Maglavit

At the habitat Golenți were recorded 31 species of birds with a total of 1057 pairs. In the year 2017 were recorded 28 species of birds with a total abundance of 340 pairs. The maximum number of individuals was collected in the year 2018, when were recorded the most species of birds 29 with a abundance of 376 pairs. In 2019, the population is declining, and is characterized by the fewest birds species with the lowest abundance of individuals 26 species of birds with a total abundance of 341 pairs.

At Golenți, *Merops apiaster* had the highest abundance 265 pairs and a dominance of 25.07-% followed by *Chroicocephalus ridibundus* with an abundance 107 pairs and a dominance of 10,12 %. *Coracias garrulus* with an abundance 104 pairs and a dominance of 9.84-% (fig. 5 and 6)

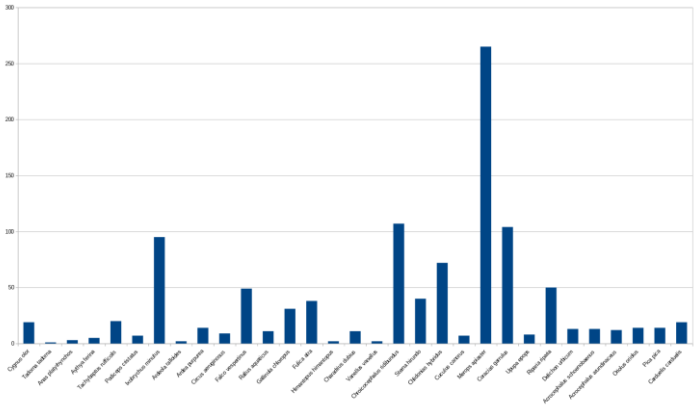

Fig. 5: Abundance of birds species, 2017, 2018, 2019, Golenți

At Lake Maglavit the dominant species were: *Merops apiaster*, *Chroicocephalus ridibundus*, *Coracias garrulus* and *Chlidonias hybridus*. The accessory species were: *Falco vespertinus*, *Fulica atra*, *Riparia riparia*, *Sterna hirundo* and the other species with values below 2.5-% was classified as accidental.

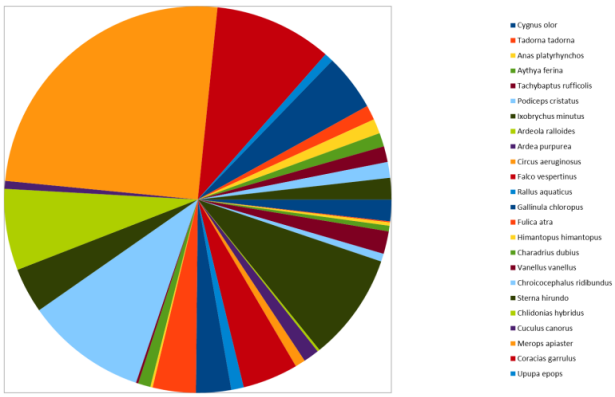

Fig. 6: Dominance of birds species, 2017, 2018, 2019, Golenți

At the habitat of deciduous forest were recorded 59 species of birds with a total of 5584 pairs. In the year 2017 were recorded 58 species of birds with a total abundance of 1627

pairs. In 2018 flight intensity began to increase and the maximum number of individuals were recorded in the year 2019, 58 species with a abundance of 2104 pairs.

In deciduous forest the most abundant species of birds in these three years were: *Corvus frugilegus* with an abundance of 1295 pairs and a dominance of 23.19-% , *Fringilla coelebs* with an abundance of 450 pairs and a dominance of 8.06 %, and *Columba palumbus* with an abundance of 435 pairs and a dominance of 7.79-% (fig. 7 and 8)

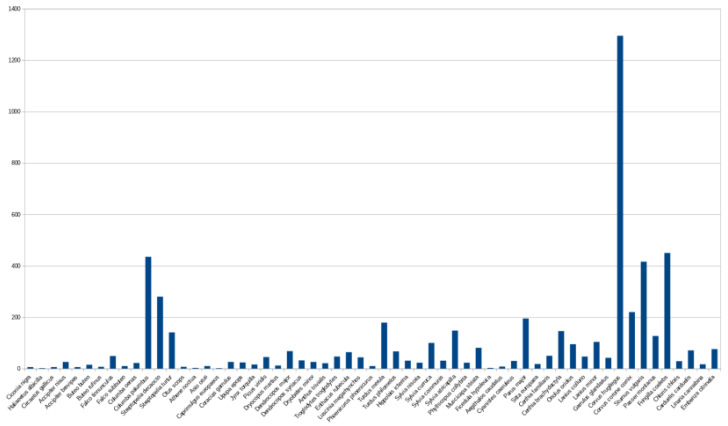

Fig. 7: Abundance of birds species, 2017, 2018, 2019, Deciduous forest

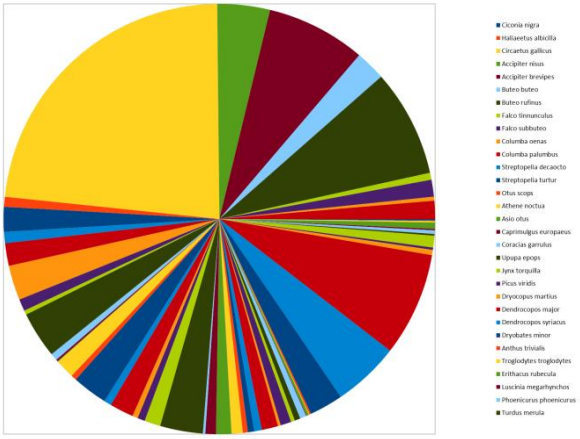

Fig. 8: Dominance of birds species, 2017, 2018, 2019, Deciduous forest

Regarding the diversity of bird species in 2017, 2018, 2019, in meadows were recorded 18 species of birds with a total of 963 pairs. Regarding the populations dynamic, we can observe that the maximum number of individuals was in 2018 when were recorded 18 species of birds with a abundance of 336 pairs.

In meadows the most abundant species of birds in the analized years were: *Alauda arvensis* with an abundance of 186 pairs and a dominance of 19.31-%, *Passer hispaniolesis* with an abundance of 141 pairs and a dominance of 14.64-% and *Anthus campestris* with an abundance of 116 pairs and a dominance of 12.05-% and *Emberiza calandra* with an abundance of 103 pairs and a dominance of 10.7-% (fig. 9 and 10)

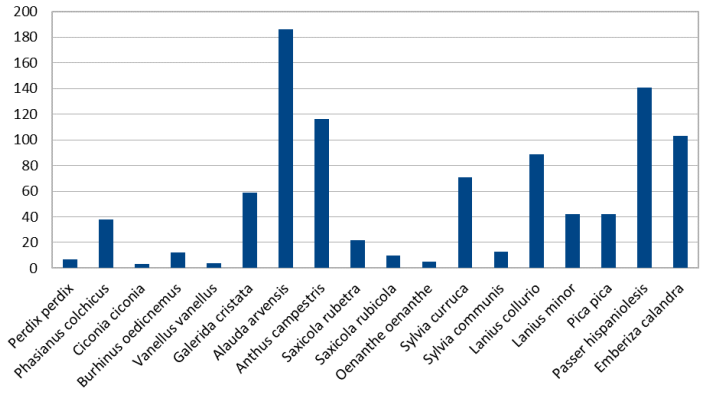

Fig. 9: Abundance of birds species, 2017, 2018, 2019, Meadows

At Meadows the dominant species were. *Alauda arvensis*, *Passer hispaniolesis*, *Anthus campestris*, *Emberiza calandra*. The accessory species were: *Pica pica*, *Lanius minor*, *Phasianus colchicus*, and the other species with values below 2.5-% was classified as accidental.

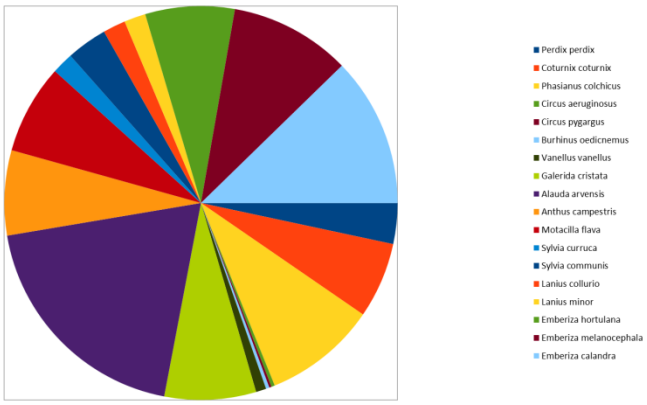

Fig. 10: Dominance of birds species, 2017, 2018, 2019, Meadows

At the farmland 18 species were recorded with a total of 1075 individuals. In the year 2017 were recorded 17 species of birds with a total abundance of 360 pairs. The maximum number of individuals was collected in the year 2018, when were recorded the most abundance of 379 pairs. In 2019, the population began to decline and have a total abundance of 336 pairs. It has been found that, the climatic conditions which are different according to the season, may influence the populations dynamic (Fericean, Rada, 2013).

At farmland, *Alauda arvensis* had the highest abundance 208 individuals and a dominance of 19.35-% followed by *Emberiza calandra* with an abundance 132 pairs and a dominance of 12.28-%. *Emberiza melanocephala* with an abundance 107 pairs and a dominance of 9.95-% and *Phasianus colchicus* with an abundance 100 pairs and a dominance of 9.3-% (fig. 11 and 12).

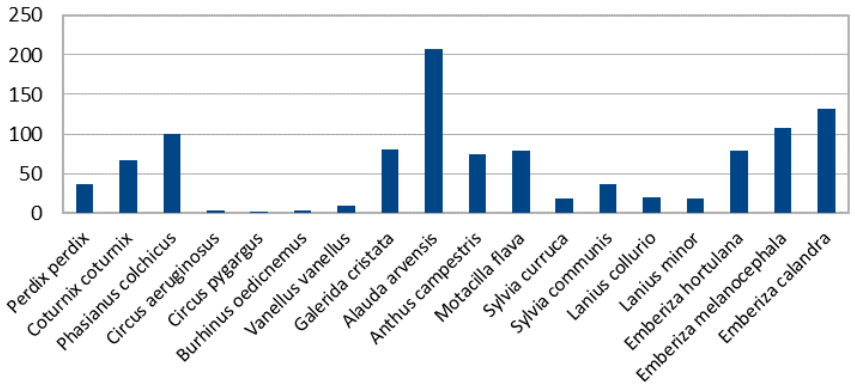

Fig. 11: Abundance of birds species, 2017, 2018, 2019, farmland

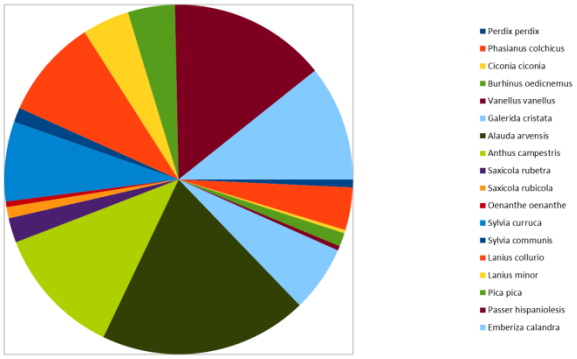

Fig. 12: Dominance of birds species, 2017, 2018, 2019, farmland

At farmland the dominant species were *Alauda arvensis*, *Emberiza calandra*, *Emberiza melanocephala*, *Phasianus colchicus* The accessory species were: *Perdix perdix*, *Sylvia communis* and the other species with values below 2.5-% was classified as accidental.

CONCLUSIONS

During our study 130 species of birds present during the nesting period were identified in the Natura 2000 ROSPA0074 Maglavit.

The list of nesting species includes a number of 121 species that have regularly nested during the 3 years of study and 9 species that have not been confirmed each season.

Of the species with the constant presence, *Egretta garzetta*, *Chlidonias hybridus*, *Coracias garrulus* are very well represented, with important populations at national level.

Among the species that have sporadically nested are *Tadorna tadorna* with certain nesting status in 2017 when we found a pair of freshly hatched goslings on Lake Golenti, *Anser anser* with certain nesting status in 2019 on Lake Fantana Banului or *Circus pygargus*, probably nesting in 2018, 2019, based on the presence of a pair during the summer season, with breeding behaviour.

The results obtained during our monitoring trials indicate some conflicting aspects as compared to the data presented in the standard form (http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=ROSPA0074). Therefore, the

absence of several species from Annex I which are likely to nest in the perimeter of the protected area (*Haliaeetus albicilla*, *Accipiter brevipes*, *Circus pygargus*, etc..) is replaced in the standard form by species which have not been identified as nesting or possibly nesting species (*Aquila pomarina*) during the 3 years of research we devoted to this project. For this reason, we suggest the document be updated.

The nesting habitats are in a good state of conservation, fact that during the three years of monitoring favoured a high consistency in the dynamics and the number of bird populations. However, the tendency of birds to choose areas that can be correlated with a lower anthropic impact has been observed, areas where, in particular, fishing is controlled and fish poaching is almost non-existent.

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Hotărârea nr. 1284/2007 privind declararea ariilor de protecție specială avifaunistică ca parte integrantă a rețelei ecologice europene Natura 2000 în România

https://observation.org/

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