

STUDIES REGARDING OF THE ORNITHOFAUNA OF THE BANKS OF THE TIMIȘ RIVER IN THE VICINITY OF MACEDONIA FOREST, TIMIȘ COUNTY, ROMANIA

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ABSTRACT

The following study concerns the diurnal ornithological fauna near the village Macedonia (Timiș county) and near the homonymous forest, on the banks of the Timiș River, an area which includes two important Natura 2000 sites. During the December of 2022 and February of 2024, a total of 76 species of birds were identified, 6 of which weren't mentioned in the standard form of the studied area. These should be introduced in a future revised standard form.

KEY WORDS: *ornithofauna, Timiș River, Macedonia Forest, revised standard form*

INTRODUCTION

The area located on the banks of the Timiș River, near the village of Macedonia, in western Romania, is a valuable habitat for the region's ornithofauna. Although it is an area of significant ecological importance, few scientific papers have been published to date on its biodiversity. Existing studies on the forest in this area have highlighted the presence of bird species of conservation interest, highlighting the need for further research.

The researched area is part of two important Natura 2000 sites: ROSCI0109 Lunca Timișului and ROSPA0095 Pădurea Macedonia (Link 2). The importance of this region for the conservation of avifauna was officially recognized with its designation as a Natura 2000 site in the year 2007, with the aim of protecting 17 species of birds. The habitat includes meadow forests, dominated by woody species such as oak, beech and hornbeam, mixed with willows, linden and acacia. The forest covers an area of approximately 4.583 ha, at an average altitude of 82 m. The banks of the Timiș River are characterized by rich riparian vegetation, providing optimal conditions for feeding and reproduction for numerous species of birds (Link 1).

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In this context, the present study aims to contribute to the knowledge of the ornithofauna in this area, highlighting the identified species and the relevant ecological aspects for their conservation.

MATERIALS AND METHODS

The area, which concerned this study, is formed out of a mix of deciduous forest, dams, lakes and pools limitrophe to the main stream of the Timiș River, agricultural fields and grasslands, in a moderate continental climate.

Following the observations, carried out at daytime, for the study during the study (December 2022 – February 2023). We have used the simple line transect method (13 km) and simple point count method: 45°31'04"N 21°01'16"E, 45°30'43"N 21°01'33"E, 45°29'29"N 21°02'04"E, 45°29'18"N 21°01'08"E, 45°29'16"N 21°00'52"E

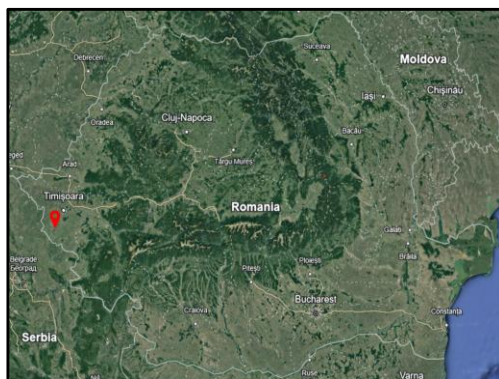


FIG 1. Geographical location of the studied area

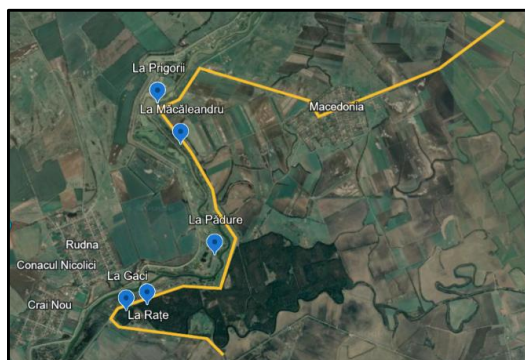


FIG 2. The transect travelled (yellow line) and the points chosen for the point observation method (blue points)

For bird observation binoculars (Yukon 20x50 WP) and a camera (Canon EOS R6, RF 800mm F11 IS STM) were used.

The exact species were determined using two ornithological guides: Håcan, Svensson. 2016 and Svensson *et al.* 2017.

All field observations were written down in a field-notebook.

RESULTS AND DISCUSSIONS

At the end of the established research period, 76 species of birds were identified (Svensson *et al.* 2017), belonging to 15 orders and 38 families (table 1.)

TABLE 1. List of species observed in the interval: December 2022 – February 2024, in the area of the Timiș bank near the village of Macedonia, Timiș.

Nr	Scientific name	Order	Family
1.	<i>Accipiter nisus</i> (Linnaeus, 1758)	Accipiteriformes	Accipiteridae
2.	<i>Aegithalos caudatus</i> (Linnaeus, 1758)	Passeriformes	Aegithalidae
3.	<i>Alcedo atthis</i> (Linnaeus, 1758)	Coraciiformes	Alcedinidae
4.	<i>Anas crecca</i> (Linnaeus, 1758)	Anseriformes	Anatidae
5.	<i>Anas penelope</i> (Linnaeus, 1758)	Anseriformes	Anatidae
6.	<i>Anas platyrhynchos</i> (Linnaeus, 1758)	Anseriformes	Anatidae
7.	<i>Anthus trivialis</i> (Linnaeus, 1758)	Passeriformes	Motacillidae
8.	<i>Ardea alba</i> (Linnaeus, 1758)	Pelecaniformes	Ardeidae
9.	<i>Ardea cinerea</i> (Linnaeus, 1758)	Pelecaniformes	Ardeidae
10.	<i>Buteo buteo</i> (Linnaeus, 1758)	Accipiteriformes	Accipiteridae
11.	<i>Buteo lagopus</i> (Pontoppidan, 1763)	Accipiteriformes	Accipiteridae
12.	<i>Carduelis carduelis</i> (Linnaeus, 1758)	Passeriformes	Fringillidae
13.	<i>Carduelis chloris</i> (Linnaeus, 1758)	Passeriformes	Fringillidae
14.	<i>Certhia familiaris</i> (Linnaeus, 1758)	Passeriformes	Certhiidae
15.	<i>Ciconia ciconia</i> (Linnaeus, 1758)	Ciconiiformes	Ciconiidae
16.	<i>Ciconia nigra</i> (Linnaeus, 1758)	Ciconiiformes	Ciconiidae
17.	<i>Circus cyaneus</i> (Linnaeus, 1766)	Accipiteriformes	Accipiteridae
18.	<i>Coccothraustes coccothraustes</i> (Linnaeus, 1758)	Passeriformes	Fringillidae
19.	<i>Columba palumbus</i> (Linnaeus, 1758)	Columbiformes	Columbidae
20.	<i>Corvus corax</i> (Linnaeus, 1758)	Passeriformes	Corvidae
21.	<i>Corvus cornix</i> (Linnaeus, 1758)	Passeriformes	Corvidae
22.	<i>Corvus frugilegus</i> (Linnaeus, 1758)	Passeriformes	Corvidae
23.	<i>Corvus monedula</i> (Linnaeus, 1758)	Passeriformes	Corvidae
24.	<i>Cuculus canorus</i> (Linnaeus, 1758)	Cuculiformes	Cuculidae
25.	<i>Cyanistes caeruleus</i> (Linnaeus, 1758)	Passeriformes	Paridae
26.	<i>Cygnus olor</i> (Gmelin, 1789)	Anseriformes	Anatidae
27.	<i>Dendrocopos major</i> (Linnaeus, 1758)	Piciformes	Picidae
28.	<i>Dendrocopos medius</i> (Linnaeus, 1758)	Piciformes	Picidae
29.	<i>Dendrocopos minor</i> (Linnaeus, 1758)	Piciformes	Picidae
30.	<i>Dryocopus martius</i> (Linnaeus, 1758)	Piciformes	Picidae
31.	<i>Egretta garzetta</i> (Linnaeus, 1766)	Pelecaniformes	Ardeidae
32.	<i>Erithacus rubecula</i> (Linnaeus, 1758)	Passeriformes	Muscicapidae

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33.	<i>Falco cherrug</i> (Gray, 1834)	Passeriformes	Falconidae
34.	<i>Falco subbuteo</i> (Linnaeus, 1758)	Falconiformes	Falconidae
35.	<i>Falco tinnunculus</i> (Linnaeus, 1758)	Falconiformes	Falconidae
36.	<i>Fringilla coelebs</i> (Linnaeus, 1758)	Passeriformes	Fringillidae
37.	<i>Fulica atra</i> (Linnaeus, 1758)	Gruiformes	Rallidae
38.	<i>Galerida cristata</i> (Linnaeus, 1758)	Passeriformes	Alaudidae
39.	<i>Gallinago gallinago</i> (Linnaeus, 1758)	Charadriiformes	Scolopacidae
40.	<i>Gallinula chloropus</i> (Linnaeus, 1758)	Gruiformes	Rallidae
41.	<i>Garrulus glandarius</i> (Linnaeus, 1758)	Passeriformes	Corvidae
42.	<i>Grus grus</i> (Linnaeus, 1758)	Gruiformes	Gruidae
43.	<i>Haliaeetus albicilla</i> (Linnaeus, 1758)	Accipiteriformes	Accipiteridae
44.	<i>Hirundo rustica</i> (Linnaeus, 1758)	Passeriformes	Hirundinidae
45.	<i>Lanius collurio</i> (Linnaeus, 1758)	Passeriformes	Laniidae
46.	<i>Larus ridibundus</i> (Linnaeus, 1766)	Charadriiformes	Laridae
47.	<i>Luscinia megarhynchos</i> (Linnaeus, 1758)	Passeriformes	Muscicapidae
48.	<i>Merops apiaster</i> (Linnaeus, 1758)	Coraciiformes	Meropidae
49.	<i>Miliaria calandra</i> (Linnaeus, 1758)	Passeriformes	Emberizidae
50.	<i>Motacilla alba</i> (Linnaeus, 1758)	Passeriformes	Motacillidae
51.	<i>Nycticorax nycticorax</i> (Linnaeus, 1758)	Pelecaniformes	Ardeidae
52.	<i>Oenanthe oenanthe</i> (Linnaeus, 1758)	Passeriformes	Muscicapidae
53.	<i>Oriolus oriolus</i> (Linnaeus, 1758)	Passeriformes	Oriolidae
54.	<i>Parus major</i> (Linnaeus, 1758)	Passeriformes	Paridae
55.	<i>Passer domesticus</i> (Linnaeus, 1758)	Passeriformes	Passeridae
56.	<i>Passer montanus</i> (Linnaeus, 1758)	Passeriformes	Passeridae
57.	<i>Phalacrocorax carbo</i> (Linnaeus, 1758)	Suliformes	Phalacrocoracidae
58.	<i>Phasianus colchicus</i> (Linnaeus, 1758)	Galliformes	Phasianidae
59.	<i>Phylloscopus sibilatrix</i> (Bechstein, 1793)	Passeriformes	Sylviidae
60.	<i>Pica pica</i> (Linnaeus, 1758)	Passeriformes	Corvidae
61.	<i>Platalea leucorodia</i> (Linnaeus, 1758)	Pelecaniformes	Threskiornithidae
62.	<i>Plegadis falcinellus</i> (Linnaeus, 1766)	Pelecaniformes	Threskiornithidae
63.	<i>Regulus regulus</i> (Linnaeus, 1758)	Passeriformes	Reguliidae
64.	<i>Riparia riparia</i> (Linnaeus, 1758)	Passeriformes	Hirundinidae
65.	<i>Saxicola torquata</i> (Linnaeus, 1758)	Passeriformes	Muscicapidae
66.	<i>Sitta europaea</i> (Linnaeus, 1758)	Passeriformes	Sittidae
67.	<i>Streptopelia decaocto</i> (Frisvaldszky, 1838)	Columbiformes	Columbidae
68.	<i>Sturnus vulgaris</i> (Linnaeus, 1758)	Passeriformes	Sturnidae
69.	<i>Sylvia atricapilla</i> (Linnaeus, 1758)	Passeriformes	Sylviidae
70.	<i>Tringa ochropus</i> (Linnaeus, 1758)	Charadriiformes	Scolopacidae
71.	<i>Troglodytes troglodytes</i> (Linnaeus, 1758)	Passeriformes	Troglodytidae
72.	<i>Turdus merula</i> (Linnaeus, 1758)	Passeriformes	Turdidae
73.	<i>Turdus pilaris</i> (Linnaeus, 1758)	Passeriformes	Turdidae
74.	<i>Turdus viscivorus</i> (Linnaeus, 1758)	Passeriformes	Turdidae
75.	<i>Upupa epops</i> (Linnaeus, 1758)	Bucerotiformes	Upupidae
76.	<i>Vanellus vanellus</i> (Linnaeus, 1758)	Charadriiformes	Charadriidae

The most abundant in species of these orders is the order Passeriformes, which totalled 51% of the identified species. The next with a big difference, however, are the orders Accipitriformes and Pelecaniformes, with a percentage of 7%.

The most abundant species of these families is the Corvidae family, with 8% of the species identified. Then follow the families Accipiteridae, Picidae, Fringillidae, Anatidae and Muscicapidae, with a total of 27%, as can be seen in figure.

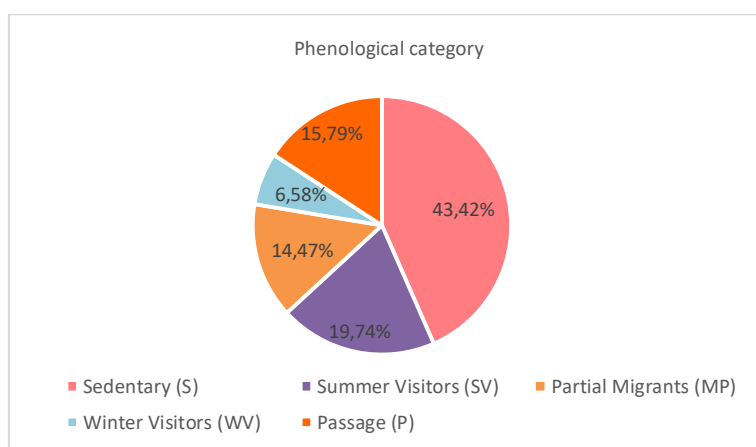


FIG. 3. Phenological distribution of the avian species recorded on the Timiș banks and in the Macedonia Forest (December 2022 – February 2024)

Phenologically (***, 2015), we find that the sedentary species to be predominant – 33 (43,42%), followed by the summer visitors – 15 (19,74%), passage species – 12 (15,79%), partial migrants – 11 (14,47%), winter visitors – 5 (6,58%).

Regarding the habitat type (***, 2015), the terrestrial species outnumber the rest – 53 (69,74%), followed by the aquatic species – 18 (23,68%) and then the amphibian species – 5 (6,58%).

As for the trophic spectrum (***, 2015), the carnivorous species are prevalent – 27 (35,53%), followed by insectivorous species – 16 (21,05%), omnivorous species – 15 (19,74%), vegetarian species – 12 (15,79 %) and polyphagous species – 6 (7,89%).

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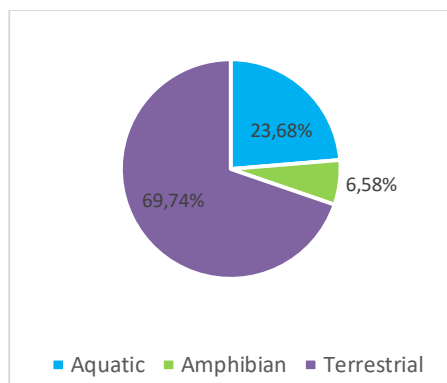


FIG. 4. Habitat distribution of the bird species in the studied area (December 2022 – February 2024)

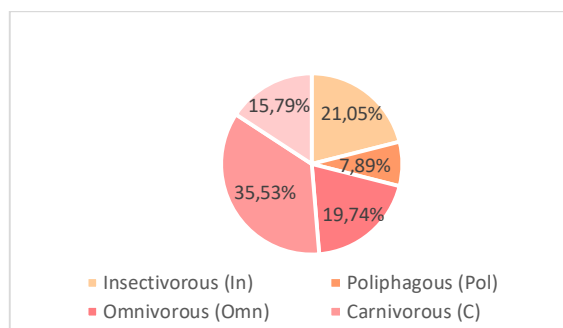


FIG. 5. Trophic niche partitioning of the birds observed on the banks of the Timiș River and in the Macedonia Forest (December 2022 – February 2024)

The Ardeidae colony in the Macedonia Forest is a mixed colony of a minimum of 350 nests, of three species: *Ardea cinerea*, *Egretta garzetta* și *Nycticorax nycticorax*.

The ornithological investigations carried out revealed a number of **6 species** (noted in the following table 2 in **BOLD**) protected by Directiva Păsări 147/2009/CEE (Link 3) which, however, were not included in the standard form of the site in the year of its designation as an avifauna protection site (2007) nor in 2011, when these forms were revised. These species are: *Haliaeetus albicilla*, *Ciconia nigra*, *Falco cherrug*, *Grus grus*, *Platylea leucorodia* and *Plegadis falcinellus*. If some of them may be present here in migration (*Grus grus*, *Platylea leucorodia* and *Plegadis falcinellus*), the case of the white-tailed Sea-eagle (*Haliaeetus albicilla*) is a special one, as this species nests in the Macedonian Forest, being identified in the spring of 2024. Direct observations

during the winter of 2024 – 2025 revealed that the nest is several years old at least, indicating the long-term presence of this species' pair.

TABLE 2. Presence of species in the standard form of the ROSPA0095 site and observed or not in the field in December 2022 – February 2024

Specie Natura 2000	Presence in the standard form of the ROSPA0095 site	Observed in the field in the present study
<i>Botaurus stellaris</i> .1	x	absent
<i>Crex crex</i> .2	x	absent
<i>Circus cyaneus</i> .3	x	x
<i>Circus pygargus</i> .4	x	absent
<i>Circus aeruginosus</i> .5	x	x*
<i>Ciconia ciconia</i> .6	x	x
<i>Dendrocopus medius</i> .7	x	x
<i>Dryocopus martius</i> .8	x	x
<i>Egretta alba</i> .9	x	x
<i>Egretta garzetta</i> .10	x	x
<i>Ixobrychus minutus</i> .11	x	absent
<i>Lanius collurio</i> .12	x	x
<i>Nycticorax nycticorax</i> .13	x	x
<i>Phalacrocorax pygmeus</i> .14	x	absent
<i>Alcedo atthis</i> .15	x	x
<i>Falco vespertinus</i> .16	x	absent
<i>Lanius minor</i> .17	x	absent
<i>Haliaeetus albicilla</i> .18	absent	x
<i>Ciconia nigra</i> .19	absent	x
<i>Falco cherrug</i> .20	absent	x
<i>Grus grus</i> .21	absent	x
<i>Platylea leucorodia</i> .22	absent	x
<i>Plegadis falcinellus</i> .23	absent	x

* During the strict period of the investigation, it was not registered. However, we mention it because it is relevant in this context and because it was noticed by us not long after the end of the data collection.

CONCLUSIONS

Therefore, the following conclusions can be reached from this study:

The total number of species identified on the banks of the Timiș River near the village of Macedonia is 76. Law 49/2011 (Link 4), which is the national legislation, includes 15 species in Annex 3 and 17 in Annex 4B. Directiva Păsări 147/2009/CEE includes 15 species of birds observed, namely: *Circus cyaneus*, *Ciconia ciconia*, *Dendrocopus medius*, *Dryocopus martius*, *Egretta alba*, *Egretta garzetta*, *Lanius collurio*, *Nycticorax nycticorax*, *Alcedo atthis*, *Haliaeetus albicilla*, *Ciconia nigra*, *Falco cherrug*, *Grus grus*, *Platylea leucorodia*, *Plegadis falcinellus*.

These results will be handed over to the custodian of the Natura 2000 site ROSPA0095 Macedonia Forest, so that they can be taken into account both in the future

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revision of the standard form and in the Management Plan of the site. We strongly advocate for the inclusion of the 6 species mentioned above in the future revised standard form.

The bird species presented in this research encounter threats that significantly influence their lives, including plastic and noise pollution, deforestation, overfishing, aggressive tourism. In this respect, we recommend the reinforcement of the following conservation measures: a better waste management, prohibition of cutting trees and reedbeds, total prohibition of ATVs entering the meadow and forest, responsible organization of tourist activities, practice responsible fishing.

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