SPECIES OF BIRDS FROM THE VIDRARU DAM BASIN (ARGEŞ COUNTY, ROMANIA)

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Abstract. Some recent information about the avifauna of the Vidraru mountain Dam Basin, located in the Southern Carpathians, Romania, are showed in this paper. During a year of study that followed mainly the birds specific to the lake, 66 species were observed, of which 14 were waterbirds, and 9 – *Tadorna tadorna* (Linnaeus, 1758), *Aythya ferina* (Linnaeus, 1758), *Spatula clypeata* (Linnaeus, 1758), *Mareca penelope* (Linnaeus, 1758), *Tachybaptus ruficollis* (Pallas, 1764), *Podiceps cristatus* (Linnaeus, 1758), *Ardea cinerea* Linnaeus, 1758, *Phalacrocorax carbo* (Linnaeus, 1758) and *Tringa ochropus* Linnaeus, 1758, 64.98% – were mentioned for the first time in the area. Except for *Mergus merganser* Linnaeus, 1758, the only breeding species, *Ardea cinerea* and *Phalacrocorax carbo* were frequently found all year round and *Anas platyrhyncos* Linnaeus, 1758 and *Tachybaptus ruficollis*, during the winter, which show that a stable and still poor avifauna has developed on the dam basin. The data suggest that the Făgăraș Mountains are a major obstacle to pass for many aquatic migratory species.

Keywords: birds, breeding, migration, mountain dam basin.

Rezumat. Specii de păsări de pe lacul montan de acumulare Vidraru (județul Argeș, România). În această lucrare sunt prezentate câteva date despre avifauna recentă a lacului de acumulare Vidraru din Carpații Meridionali, România. De-a lungul unui an de studiu în care am urmărit îndeosebi păsările acvatice, 66 de specii au fost observate, iar, dintre acestea, 14 au fost caracteristice zonelor umede, 9 – *Tadorna tadorna* (Linnaeus, 1758), *Aythya ferina* (Linnaeus, 1758), *Spatula clypeata* (Linnaeus, 1758), *Mareca penelope* (Linnaeus, 1758), *Tachybaptus ruficollis* (Pallas, 1764), *Podiceps cristatus* (Linnaeus, 1758), *Ardea cinerea* Linnaeus, 1758, *Phalacrocorax carbo* (Linnaeus, 1758) and *Tringa ochropus* Linnaeus, 1758, 64.98% – fiind menționate pentru prima data în zonă. Exceptând *Mergus merganser* Linnaeus, 1758, singura specie cuibăritoare, *Ardea cinerea* și *Phalacrocorax carbo* au fost întâlnite frecvent tot anul, iar *Anas platyrhyncos* Linnaeus, 1758 și *Tachybaptus ruficollis*, iarna, ceea ce atestă că pe lacul de acumulare s-a format o avifaună stabilă, dar încă săracă. Datele arată că Munții Făgăraș sunt pentru multe specii migratoare acvatice un obstacol major de trecut.

Cuvinte cheie: păsări, cuibărire, migrație, lac de acumulare montan.

INTRODUCTION

The avifauna from the Vidraru Dam Basin (The Argeş County, Romania) was studied immediately after the construction of the reservoir, although the observations were irregularly performed. The aquatic species were the main theme of study, the researches being focused on the migratory and rare species (KLEMM & KOHL, 1988; MĂTIEŞ, 1969, 1971, 1973, 1974a, 1974b; MESTECĂNEANU & MESTECĂNEANU, 2022; MUNTEANU & MĂTIEŞ, 1983; PAPADOPOL, 1979; PETRESCU, 2005; RADU, 1972; TĂLPEANU & PASPALEVA, 1979; WEBER, 1970).

The aim of this paper was to establish a picture of the fauna of birds found here during a year of study, almost two decades after the last major study that deal with the birds from the end of the summer (PETRESCU, 2005) and about 50 years after the first studies in the area (MĂTIEŞ, 1969, 1974b). The changes experienced by the wetland avifauna during this time and its dynamics were especially envisaged.

MATERIALS AND METHODS

Regarding **the natural setting**, Vidraru is an artificial lake, built on the Argeş River, at ca. 830 m a.s.l. (https://energie.gov.ro/), put into use in 1965. It is 166 m, the height of the dam, and 1,000 ha, the maximum area (by http://tw.baraje.ro/rrmb), while the deepest water is 155 m (MAILAT, 2010). Apart from the production of electric energy, it is important in flood regularisation and as a recreational and fish growing place. The Transfăgărăşan Road, which follows the Argeş River, borders its eastern bank, while the Argeş River, one of the main tributaries of the Danube from its lower hydrographical basin, which cross the southern slopes of the Carpathians, the Sub-Carpathians, the Argeş Hills and the Romanian Plain before the point of discharge, originates at the confluence between Buda and Capra, where the dam basin sits (BARCO & NEDELCU, 1974). Cumpăna, Valea cu Peşti, Valea lui Stan and Limpedea, the last two also having catchments, as well as the Topolog, Cumpăniţa, Dobroneagu, Cernatu, Bradu, Draghina, and Baciu, are other significant streams that flow into it and, as a result, the total underpinning area is 746.8 km^2 (UJVÁRI, 1972).

The northern third of the dam basin pertains to the area of crystalline rocks of the long southern ridges of the Făgăraş Mountains (Moldoveanu, 2,543 m, the highest peak), while the southern part belongs to the low elevations of an intermountain couloir of Miocene conglomerates (BARCO & NEDELCU, 1974), the Loviştea Depression. The dam was realised in the epigenetic gorges of the Argeş River, carved in the Ghiţu-Frunţi gneisses (UJVÁRI, 1972).

The climate of the area is temperate mountain continental. The annual amount of precipitations is ca. 1,000 mm, while the annual temperature of the air is ca. 5°C. Water temperature decreases below 1°C in November, when, usually, the ice sheet starts to appear, and increases again in March-April (BARCO & NEDELCU, 1974). An increase of ca. 2°C of the yearly air temperature and a decrease of ca. 200 mm of the annual mean of precipitations were recently observed

(https://www.meteoblue.com/). During the observations, the air temperature (at 14:00 hours) ranged from 2°C on February 4, 2023 to 29°C on August 18, 2022, the snow from the banks was found between January 21, 2023 and February 18, 2023 (maximum 30 cm depth, on February 4, 2023), the ice shell was present in February (ca. 10% from the lake area, in the inlets) and the water level was minimal between the end of July and the beginning of January and maximal in May-June.

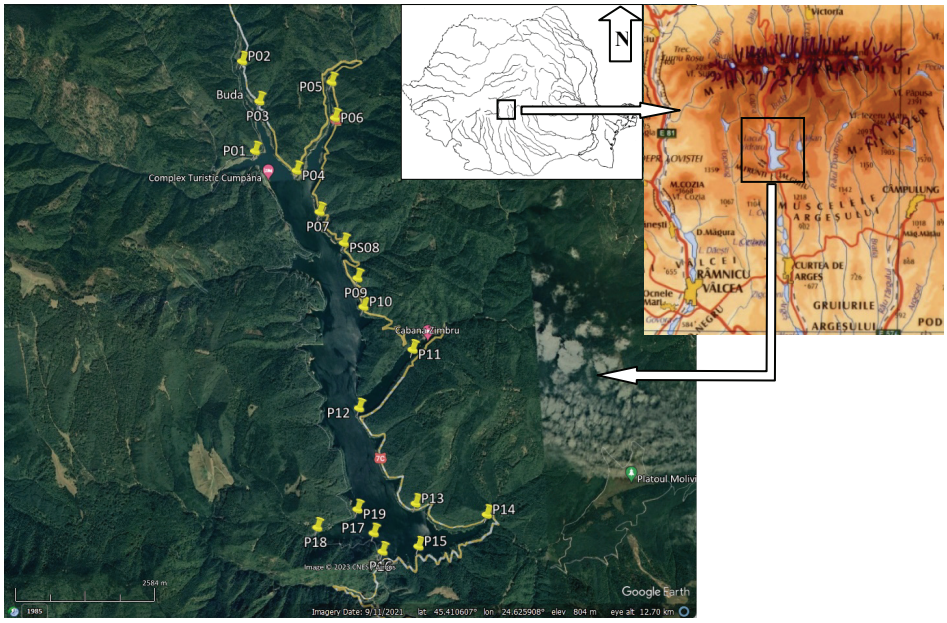

Figure 1. The map of the Vidraru Dam Basin, with the points of observations and its location in the Southern Carpathians (by Google Earth and https://i0.wp.com/, modified).

The vegetation of the area is composed by coniferous trees, mainly of *Picea abies* (L.) H. Karst., by mixed forests, on most reservoir banks, and by wood of *Fagus sylvatica* L., in the downstream sector. Tall vegetation of eutrophic waters and swamps, short vegetation of puddles and oozy soils, segetal and ruderal vegetation, rocky region vegetation, mesophilic lawn vegetation, woods clearing vegetation, mountain weed vegetation, river meadow vegetation, vegetation of foliage and resinous mixture, resinous forest vegetation were identified (ALEXIU, 1999).

The aquatic and amphibious fauna of inferior vertebrates is relatively scarce, 17 species of amphibians and 12 species of fish being identified in the reservoir and in the surrounding area: *Rana temporaria* Linnaeus, 1758, *Salamandra salamandra* (Linnaeus, 1758), *Triturus montandoni* (Boulenger, 1880), *Triturus alpestris* (Laurenti, 1768), respectively: *Cottus gobio* Linnaeus, 1758, *Phoxinus phoxinus* (Linnaeus, 1758), *Salmo trutta fario* Linnaeus, 1758, *Barbus petenyi* Heckel, 1848 etc. (STĂNESCU, 1972a, 1972b; LINELL & KALTENBORN, 2016). IFTIME (2005) found 14 amphibian and reptile species here. The Vidraru Dam Basin was considered a very fit lake for salmonids aquaculture (VASILIU, 1969), although it is more an oligotrophic than a eutrophic lake (DIACONU, 2008).

As regards **the time and method of work**, the study was performed during April 2022 – March, 2023, when 2-4 field researches a month were done, resulting in a total of 30 days of monitoring. The observations were generally performed between 9:30 and 18:30, by the length of the daylight, from 19 points of observations placed on the visible and accessible all year shores, visited from upstream to downstream, which covered over 95% of the basin surface. The waterbirds were especially surveyed, using a 67X scope, binoculars and a photo camera.

The data were worked by the conventional methods (GACHE, 2002; ZAMFIRESCU & ZAMFIRESCU, 2008) while the species denomination matches with that used by the International Union for Conservation of Nature – IUCN and the BirdLife International, although the taxonomic classification is disputable (see, EUNIS). The individuals of *Larus cachinnans* Pallas, 1811 and *L. michahellis* Naumann, 1840 could not always identified at level of species and therefore all were treated together as *Larus cachinnans*/*L. michahellis*, corresponding to one species, as they were previously recognised – *L. argentatus* Pontoppidan, 1763 or *L. cachinnans* (by SNOW & PERRINS, 1998).

RESULTS AND DISCUSSIONS

It is known that the dam basins modify the natural landscape and change the original biodiversity of the rivers (MUNTEANU, 1978; MUNTEANU & MĂTIEŞ, 1983). While some species are seriously affected – for instance, the near extinct fish *Romanichtys valsanicola* Dumitrescu, Bălănescu, Stoica, 1957, which disappeared from the Argeş River because of the biotope alteration after the Vidraru Dam Basin building (TRUŢĂ & STANCU, 2016) – other groups, like some birds, benefit from them (MUNTEANU & MĂTIEŞ, 1983). This happened when, during a year of study, 14 waterbird species were found on the dam basin. They represent 21.21% of all 66 species, which means that most of them inhabited the remained dryland habitats from the banks. The waterbirds were either aquatic species or

amphibious species. *Cinclus cinclus* and *Motacilla cinerea* are directly dependent on waters, too, but these are not waterbirds (cf. Wetland International). The species belong to 12 orders and 28 families, while the waterbirds belong to 5 orders – Anseriformes, Podicipediformes, Pelecaniformes, Suliformes and Charadriiformes (41.66% of all orders) and 6 families – Anatidae, Podicipedidae, Ardeidae, Phalacrocoracidae, Scolopacidae and Laridae (21.42% of all families). The richest order in species was Passeriformes (42 species, 63.64% of all) and the richest family was Fringillidae (8 species, 12.12% of all), while Anseriformes, respectively Anatidae were the richest regarding the waterbird species (7 species, 50% of all waterbird species, each) (Table 1).

The list can be extended, since *Nycticorax nycticorax* (Linnaeus, 1758), *Pernis apivorus* (Linnaeus, 1758), *Aquila chrysaetos* (Linnaeus, 1758), *Falco peregrinus* Tunstall, 1771, *Strix uralensis* Pallas, 1771, *Phoenicurus phoenicurus* (Linnaeus, 1758), *Turdus pilaris* Linnaeus, 1758, *Phylloscopus sibilatrix* (Bechstein, 1793), *Acrocephalus palustris* Bechstein, 1798, *Tichodroma muraria* (Linnaeus, 1766), *Lanius collurio* Linnaeus, 1758 etc. were previously seen here by us and other species were observed in time by other authors (WEBER, 1970; RADU, 1972; MĂTIEȘ, 1971, 1973, 1974a, 1974b; PETRESCU, 2005) (Table 1). We did not include *Tetrao urogallus*, found at 1,700 m a.s.l. on the Clăbucet Mountain from vicinity (MĂTIEȘ, 1971).

Table 1. Species of birds observed in the Vidraru Dam Basin area by other authors and during the present study.

No.	Order/Family/Species	Mătieș (1969)	Weber (1970)	Mătieș (1971)	Radu (1972)	Mătieș (1973)	Mătieș (1974a)	Mătieș (1974b)	Petrescu (2005)	Personal researches (2022-2023)							
										Hiemal season	Prevernal season	Vernal season	Estival season	Serotinal season	Autumnal season	Phenology in the area	Breeding
I. Anseriformes																	
I.1. Anatidae																	
1	*Anser anser* (Linnaeus, 1758)							?									
2	*Anser albifrons* (Scopoli, 1769)							+		+	-	-	-	-	-	P	NB
3	*Mergus merganser* Linnaeus, 1758									+	+	+	+	+	+	R, P, WV	CB
4	*Tadorna tadorna* (Linnaeus, 1758)									+	+	-	-	-	-	P	NB
5	*Aythya ferina* (Linnaeus, 1758)									-	+	-	-	-	-	P	NB
6	*Aythya nyroca* (Güldenstädt, 1770)							+									
7	*Spatula querquedula* (Linnaeus, 1758)							+									
8	*Spatula clypeata* (Linnaeus, 1758)									+	-	-	-	-	-	P	NB
9	*Mareca penelope* (Linnaeus, 1758)									+	+	-	-	-	-	WV, P	NB
10	*Anas platyrhynchos* Linnaeus, 1758							+	+	+	+	-	-	-	+	WV, P, SV?	NB
11	*Anas acuta* Linnaeus, 1758							+									
12	*Anas crecca* Linnaeus, 1758							+									
II. Podicipediformes																	
II.1. Podicipedidae																	
13	*Tachybaptus ruficollis* (Pallas, 1764)									+	-	-	-	-	+	WV, P	NB
14	*Podiceps cristatus* (Linnaeus, 1758)									+	-	-	-	-	-	P	NB
III. Columbiformes																	
III.1. Columbidae																	
15	*Columba palumbus* Linnaeus, 1758									+	+	+	+	+	+	PM, P	CB
16	*Streptopelia decaocto* Frivaldszky, 1838								+								
IV. Caprimulgiformes																	
IV.1. Apodidae																	
17	*Tachymarptis melba* (Linnaeus, 1758)									-	+	+	+	+	+	P, SV	CB
18	*Apus apus* (Linnaeus, 1758)									-	-	+	+	-	-	SV	CB
V. Cuculiformes																	
V.1. Cuculidae																	
19	*Cuculus canorus* Linnaeus, 1758	+								-	-	-	+	-	-	SV	PB

VI. Gruiformes																	
VI.1. Rallidae																	
20	*Gallinula chloropus* (Linnaeus, 1758)					+		+									
21	*Fulica atra* Linnaeus, 1758					+		+									
VII. Gaviiformes																	
VII.1. Gaviidae																	
22	*Gavia arctica* (Linnaeus, 1758)	+						+									
VIII. Ciconiiformes																	
VIII.1. Ciconiidae																	
23	*Ciconia ciconia* (Linnaeus, 1758)			+													
IX. Pelecaniformes																	
IX.1. Ardeidae																	
24	*Ardea cinerea* Linnaeus, 1758									+	+	-	+	+	+	P, WV, SV	NB
25	*Ardea alba* Linnaeus, 1758								+								
X. Suliformes																	
X.1. Phalacrocoracidae																	
26	*Phalacrocorax carbo* (Linnaeus, 1758)									+	+	+	+	+	+	SV, P, WV	NB
XI. Charadriiformes																	
XI.1. Charadriidae																	
27	*Eudromias morinellus* (Linnaeus, 1758)		+														
XI.2. Scolopacidae																	
28	*Actitis hypoleucos* (Linnaeus, 1758)							+		+	-	-	-	+	-	P, SV?, WV	NB
29	*Tringa ochropus* Linnaeus, 1758									-	+	-	+	-	-	P	NB
XI.3. Laridae																	
30	*Larus ridibundus* Linnaeus, 1766								+								
31	*Larus cachinnans* Pallas, 1811/*L. michahellis* Naumann, 1840									+	+	+	+	-	+	SV, P, WV	NB
XII. Strigiformes																	
XII.1. Strigidae																	
32	*Athene noctua* (Scopoli, 1769)								+								
33	*Strix aluco* Linnaeus, 1758								+	+	-	-	-	-	-	R	PB
XIII. Accipitriformes																	
XIII.1. Accipitridae																	
34	*Clanga pomarina* (Brehm, 1831)						+		+								
35	*Aquila chysaetos* (Linnaeus, 1758)								+								
36	*Accipiter nisus* (Linnaeus, 1758)						+			-	+	-	-	+	+	SV, P	PB
37	*Accipiter gentilis* (Linnaeus, 1758)						+		+								
38	*Buteo buteo* (Linnaeus, 1758)						+		+	-	+	+	+	+	+	SV, P	CB
XIV. Bucerotiformes																	
XIVI.1. Upupidae																	
39	*Upupa epops* Linnaeus, 1758	+															
XV. Piciformes																	
XV.1. Picidae																	
40	*Dryocopus martius* (Linnaeus, 1758)									-	+	-	+	-	-	R	PB
41	*Leiopicus medius* (Linnaeus, 1758)								+								
42	*Dendrocopos leucotos* (Bechstein, 1802)								+	-	-	+	-	+	-	R	PB
43	*Dendrocopos major* (Linnaeus, 1758)								+	+	+	-	+	+	+	R	CB
XVI. Falconiformes																	
XVI.1. Falconidae																	
44	*Falco tinnunculus* Linnaeus, 1758						+		+								
XVII. Passeriformes																	

XVII.1. Oriolidae																
45	*Oriolus oriolus* (Linnaeus, 1758)	+		+					+							
XVII.2. Laniidae																
46	*Lanius collurio* Linnaeus, 1758	+							+							
XVII.3. Corvidae																
47	*Garrulus glandarius* (Linnaeus, 1758)	+							+	+	+	+	+	+	+	R	CB
48	*Nucifraga caryocatactes* (Linnaeus, 1758)								+	-	-	-	+	-	+	R	PB
49	*Corvus corax* Linnaeus, 1758								+	+	+	+	+	-	+	R	CB
XVII.4. Paridae																
50	*Periparus ater* (Linnaeus, 1758)								+	+	+	+	+	+	+	R, P	CB
51	*Lophophanes cristatus* (Linnaeus, 1758)									+	+	+	+	+	+	R	CB
52	*Poecile palustris* (Linnaeus, 1758)									+	+	+	+	-	+	R	PB
53	*Poecile montanus* (Conrad von Baldenstein, 1827)								+	+	+	+	+	+	+	R	PB
54	*Cyanistes caeruleus* (Linnaeus, 1758)								+	+	+	-	-	-	+	P, WV, R?	NB
55	*Parus major* Linnaeus, 1758								+	+	+	+	+	+	+	R, P	CB
XVII.5. Hirundinidae																
56	*Delichon urbicum* (Linnaeus, 1758)								+	-	+	+	+	+	+	SV, P	CB
57	*Hirundo rustica* Linnaeus, 1758								+	-	+	-	+	+	+	SV, P	CB
58	*Ptyonoprogne rupestris* (Scopoli, 1769)								+	-	+	+	+	+	-	SV	CB
XVII.6. Phylloscopidae																
59	*Phylloscopus trochilus* (Linnaeus, 1758)								+	-	-	-	-	-	+	P	NB
60	*Phylloscopus collybita* (Vieillot, 1817)	+							+	-	+	+	+	+	+	SV, P	CB
XVII.7. Aegithalidae																
61	*Aegithalos caudatus* (Linnaeus, 1758)									+	-	+	+	+	+	R	CB
XVII.8. Sylviidae																
62	*Sylvia atricapilla* (Linnaeus, 1758)									-	+	+	+	-	+	SV	CB
63	*Curruca curruca* (Linnaeus, 1758)								+	-	+	+	+	-	+	SV	PB
XVII.9. Certhiidae																
64	*Certhia familiaris* Linnaeus, 1758								+	+	+	+	+	+	+	R	PB
XVI.10. Sittidae																
65	*Sitta europaea* Linnaeus, 1758								+	+	+	-	+	+	+	R	CB
XVII.11. Troglodytidae																
66	*Troglodytes troglodytes* (Linnaeus, 1758)								+	+	+	+	+	+	+	R	CB
XVII.12. Cinclidae																
67	*Cinclus cinclus* (Linnaeus, 1758)	+							+	+	+	-	-	-	-	WV	NB
XVII.13. Sturnidae																
68	*Sturnus vulgaris* Linnaeus, 1758								+								
XVII.14. Turdidae																
69	*Turdus viscivorus* Linnaeus, 1758	+								+	+	+	+	+	+	R	PB
70	*Turdus philomelos* Brehm, 1831	+								-	+	+	+	+	+	SV	CB
71	*Turdus merula* Linnaeus, 1758								+	+	+	+	-	+	+	PM	CB
72	*Turdus torquatus* Linnaeus, 1758	+															
XVII.15. Muscicapidae																
73	*Erithacus rubecula* (Linnaeus, 1758)								+	-	+	+	+	+	+	SV	CB
74	*Ficedula albicollis* (Temminck, 1815)									-	+	+	+	-	-	SV	PB
75	*Ficedula parva* (Bechstein, 1792)									-	-	+	+	+	-	SV	PB
76	*Phoenicurus ochruros* (Gmelin S. G., 1774)	+							+	-	+	-	-	+	+	SV, P	CB
77	*Phoenicurus phoenicurus* (Linnaeus, 1758)								+								

78	*Oenanthe oenanthe* (Linnaeus, 1758)	+														
XVII.16. Regulidae																
79	*Regulus ignicapilla* (Temminck, 1820)									-	+	+	+	-	+	PM	PB
80	*Regulus regulus* (Linnaeus, 1758)								+	+	+	+	+	-	+	PM	PB
XVII.17. Prunellidae																
81	*Prunella modularis* (Linnaeus, 1758)								+	-	+	-	+	-	+	SV, P	CB
XVII.18. Passeridae		+														
82	*Passer domesticus* (Linnaeus, 1758)								+								
XVI.19. Motacillidae																
83	*Anthus trivialis* (Linnaeus, 1758)								+								
84	*Anthus spinoletta* (Linnaeus, 1758)	+								-	-	-	-	-	+	P	NB
85	*Motacilla cinerea* Tunstall, 1771	+							+	-	+	+	+	+	+	SV, P	CB
86	*Motacilla alba* Linnaeus, 1758	+							+	-	+	+	+	+	+	SV, P	CB
XVII.20. Fringillidae																
87	*Fringilla coelebs* Linnaeus, 1758								+	+	+	+	+	+	+	PM, P	CB
88	*Fringilla montifringilla* Linnaeus, 1758									+	-	-	-	-	+	P	NB
89	*Coccothraustes coccothraustes* (Linnaeus, 1758)									+	+	-	-	-	+	P, WV, SV?	NB
90	*Pyrrhula pyrrhula* (Linnaeus, 1758)	+							+	+	-	+	-	+	+	R	PB
91	*Loxia curvirostra* Linnaeus, 1758									-	-	-	+	-	-	R	PB
92	*Carduelis carduelis* (Linnaeus, 1758)									+	+	-	-	-	+	P, WV, SV?	NB
93	*Serinus serinus* (Linnaeus, 1766)	+								-	-	-	-	-	+	P, SV?	NB
94	*Spinus spinus* (Linnaeus, 1758)									+	+	-	-	-	+	P, WV, R?	NB
XVII.21. Emberizidae																
95	*Emberiza cirlus* Linnaeus, 1766				+												
Total species										37	48	35	42	33	48		
Total waterbird species										12	8	3	4	4	6		

Legend: + – presence, - – absence, R – resident species, PM – partial migrant species, SV – summer visitor, WV – winter visitor, P – species of passage, ? – uncertainly, NB – non-breeding species, PB – probably breeding species, CB – certainly breeding species.

The main maximums of the total number of species were in the autumnal and the prevernal seasons (72,73% of all species, each), while the fewest species were recorded in the serotinal and the vernal seasons (50.00%, respectively 53.03%) (Table 1). The hiemal season, the longest of all, summed only 56.06% of all species, while the aestival season, one of the shortest, 63.64%. Instead, most of the waterbird species (85.71% of them) were recorded in the hiemal season, while 57.14% were registered in the prevernal and 42.85%, in the autumnal. The vernal season, with 21.42% of all species, was the poorest, while the aestival and the serotinal had, each, 28.57% of all waterbird species. Among the waterbird species occurred in the hiemal, 6, 50.00%, were considered principally as species of passage, 3, 25.00%, as winter visitors, 2, 16.66%, as summer visitors, and 1, 8.33%, as resident species. 4 species among the hiemal ones, 28.57% of all waterbird species, were recorded in the vernal-aestival, too. Finally, during the prevernal, serotinal and autumnal seasons, generally associated with the passage, 11 species, 78.57% of all waterbird species, were registered, 5 among them, 45.45%, being mainly species of passage. Consequently, the reservoir is still used as a point for rest by migratory birds, although it can attract some for longer periods (MUNTEANU & MĂTIEȘ, 1983; PETRESCU, 2005). We considered: hiemal – November-February, prevernal – March-April, vernal – May, aestival – June, serotinal – July-August and autumnal – September-October (by GACHE, 2002). MUNTEANU (2000) accepted other time distribution, but I think that the ecological seasons still must be shifted, in the conditions of the present climate changes.

Only 12 species (18.18% of total) were common for all seasons (*Mergus merganser*, *Phalacrocorax carbo* among the waterbirds), although other species (including *Larus cachinnans/L. michahellis*) probably are present every season, too, even if they have not appeared in the records. Most of the species (21, 31.82%) were considered summer visitors in the area. The resident species and the species of passage had 28.79%, respectively 25.76%, while the partial migrant species and the winter visitors 7.58%, respectively 6.06%, the last group in relation with the scarcity of the food from the cold time, offered by the coniferous and the mixed forest that predominate in the area. Thus, 28 species (43.07% of all) were mostly found in the cold time, while 44 species (67.92% of all species) were mostly found in the warm time, although almost every species belongs to more phenological categories. Equally, 41 species (63.07% of all) were met mainly during the passage time. Regarding the waterbirds, most of them were considered chiefly of passage (8 species, 57.14%); they were followed by the winter visitors (3 species, 21.43%), summer visitors (2 species, 14.29%) and residents (1 species, 7.14%). No partial migrant

species were registered. Thus, 4 species (28.57% of all waterbird species) were mostly met in the cold season, 3 species (21.42% of all waterbird species) were chiefly met in the warm season, and 9 species (64.28% of all waterbird species) were met mainly in the passage season. The waterbird avifauna of the Vidraru Dam Basin was, consequently, rather poor, as a result of the harsh life environment of this dam basin rather deprived from food resources. There are some remarks: *Accipiter nisus*, *Buteo buteo*, *Delichon urbicum*, *Hirundo rustica*, *Motacilla alba*, *M. cinerea* were considered summer visitors, *Columba palumbus* and *Fringilla coelebs*, partial migrant species, and *Mergus merganser* and *Periparus ater*, resident species, because all of them bred in the area, although a significant number of individuals passed here in the passage; for some resident (*Mergus merganser*, *Periparus ater*, *Parus major*, *Pyrrhula pyrrhula*, *Turdus viscivorus*) or partial migrant (*Columba palumbus*, *Regulus ignicapilla*, *R. regulus*, *Turdus merula*, *Fringilla coelebs*) species, it is difficult to say whether the remaining individuals over winter represent truly resident or vicariant populations; we considered that some individuals of *Anas platyrhynchos*, *Tachymarptis melba*, *Actitis hypoleucos*, *Coccothraustes coccothraustes*, *Carduelis carduelis*, *Serinus serinus* were also summer visitors in the area, and some individuals of *Spinus spinus* and *Cyanistes caeruleus*, residents, although they were not registered during the respective periods; most of the species have a lesser or a higher percentage of passage of individuals through the area. Our data confirmed MĂTIEȘ (1969, 1973), because the middle and upper hydrographical basin of the Argeș River is used in migration by some birds, despite the barrier of the Făgăraș Mountains. Many species were determined to choose the easier routes through the passes from the West and East, although the majority prefers to completely avoid the Carpathians (MĂTIEȘ, 1971). Since the autumn passage was poorer than the spring one (for instance, 6 species were found in the autumnal, versus 8 species, in the prevernal) and, agreeing that all species had migratory individuals and the spring passage lasts, by extension, between January and June and the autumn passage, between July and December, 13 species were found in the spring passage, while 8 species in the autumn passage. We think that, in the autumn passage, some species stopped here after they passed the ridges, others probably flew away, while some of them wandered, coming from South, on the Argeș River. Instead, in the spring passage, following the river (sometimes, probably, with poor visibility), the birds arrived here, and, after a period, deflected to the Turnu Roșu – Cozia Corridor, from the Olt Valley, or to the Rucăr – Bran Corridor, from the eastern border of the Făgăraș Mountains, or headed to the higher passes (Călțun, Bâlea, Arpaș etc.), directly crossing to Transylvania.

27 species (40.91%) were considered certain breeders, 17 (25.76%), probable breeders and 22 (33.33%), non-breeders (Table 1). Noticeable are *Tachymarptis melba* and *Ptyonoprogne rupestris*, which bred at the dam, and *Corvus corax*, which bred on the rocky wall, near the dam. The breeding species reached 66.67%, but the percentage can increase with species who may be summer visitors or residents, or have remained unnoticed. As for the waterbirds, only 1 species, *Mergus merganser*, 7.14% of them, was certain breeder, 3 females with chicks being registered, which confirms a prior study (MESTECĂNEANU & MESTECĂNEANU, 2022), meaning a density of 0.3 pairs/100 ha. The importance of the lake for breeding remains still low (MUNTEANU & MĂTIEȘ, 1983), but we think that *Anas platyrhynchos* and *Ardea cinerea* can become breeding species in some years, while *Phalacrocorax carbo* and *Larus cachinnans* / *L. michahellis* are not likely to do so at the moment, although *L. michahellis* is a certainly breeding species at Pitești, 60 km downstream. In Romania, *Phalacrocorax carbo* nests in colonies on trees and reedbeds, while *Larus cachinnans* and *L. michahellis* can use the cliffs (FÂNTÂNĂ et al., 2022), the high rocky banks, especially from the South-West of the dam basin, being suitable for them. *Actitis hypoleucos* can also be a breeding species in some years, if it wasn't like that this time already and was overlooked. While the dam is not provided with transit systems for the fish, in time, concomitantly with the increase of water eutrophication and global warming, other species can also breed here, including some between the species of passage (*Aythya ferina*, *Podiceps cristatus*) or even between the winter visitors (*Mareca penelope*, *Tachybaptus ruficollis*). *Spatula querquedula* (Linnaeus, 1758) was mentioned by RADU (1967) as a breeder up to the mixed forests, *Mareca penelope* was already found breeding in the Eastern Carpathians, *Anas platyrhynchos* and *A. crecca* were observed in summer until 1,200 m (MUNTEANU, 2012), while, according to FÂNTÂNĂ et al. (2022), several species breed in the surrounding area, in consensus with our observations, partially published (MESTECĂNEANU, 2008).

A total of 1,853 individuals of waterbirds were counted (no more than 560, in November, and no less than 36, in May), although some of them were seen several times in different sessions of field observations. Their dynamics reflects the phenology and the breeding, but also the number of days of field researches (Table 2). To avoid this, judging by the average of individuals/day of field researches, a maximum appears in November, because of *Anser albifrons*. The months from the hiemal season were characterised by more than 65 individuals for a day of observation, while high means were also associated with March and October, from the passage time. The lowest values were attained in May and July, thanks to *Ardea cinerea*, *Phalacrocorax carbo*, *Tringa ochropus, Larus cachinnans* / *L. michahellis* and juveniles of *Mergus merganser*. Eliminating *Anser albifrons*, the means were 51.0 for November, 70.3 for the hiemal season and 46.5 for all year. Regarding the average of the number of species for a day of field researches, it was the highest in February and the lowest in July. 1 species was noted on July 3, 2022, while the maximum – 7 species – were recorded on February 4 and 25, respectively on March 4, 2023. *Anser albifrons* achieved a mean of 229 individuals a day in November. Found every month, *Mergus merganser* had the highest values in March and December, during the passage season, but relatively high figures were also realised in January, February (for the wintering and passage individuals) and October, when another peak of migration was detected. The migratory individuals leaved in April, and the youth had a new, but low, peak in June. In July and August, when the minimum values were recorded, most of the adults had probably deserted the area for moulting and some chicks probably died, although some individuals perhaps remained unobserved (Fig. 2). *Mareca penelope*

was present in February and March as a winter visitor and passage species. The highest values among all waterbird species, except for *Anser albifrons*, were attained by *Anas platyrhynchos*, with not less than 58.0 individuals on average during a day of observation, in January. Until the end of April, all individuals left the area, to appear again in September. *Tachybaptus ruficollis* achieved good values in December and January, lower ones in February and November, and, mostly, in October, and was absent in the rest of the period. *Ardea cinerea* occurred almost the entire year, with low figures, the highest one in August, during the autumn passage Although it was a non-breeder, *Phalacrocorax carbo* was also found every month, with the highest means in October, and November, in post-breeding migration. A noticeable value was found in January, showing that the dam basin is a wintering area for it, too. *Larus cachinnans* / *L. michahellis* occurred during February and March, in the spring passage, then, mostly, during May and June (on average, over 5.0 individuals on a day of observation), as a summer species, and in September, in the autumn passage. Among the other species, all of passage in the area, *Tadorna tadorna*, *Aythya ferina*, *Podiceps cristatus* and *Tringa ochropus* achieved low means, regardless of the considered period, while *Spatula clypeata* was somewhat better represented, in February. *Actitis hypoleucos* also reached low values, being present in the area as a passage species, although we saw it in summer on other occasions. Its record in winter is remarkable (Fig. 3), although it was considered a summer visitor or a passage species in Romania (RADU, 1979, CIOCHIA, 1992; BRUUN et al., 1999; MUNTEANU, 2012, SVENSSON, 2017 etc.). We suspect that certain individuals can sometime become even residents on the dam basin, which should represent an adaptation to global warming. Currently, in Europe, a few winter towards North, to Britain, in the maritime climatic zone, around the Mediterranean basin and, sporadically, in Benelux and Central Europe (SNOW & PERRINS, 1998).

Figure 2. Juveniles of *Mergus merganser* resting motionless on the shore, on September 4, 2022 (original).

Figure 3. Individual of *Actitis hypoleucos* observed on February 4, 2023 (original).

Regarding the absolute abundancy, *Anas platyrhynchos* attained the maximum in January, March and December, but large fluctuations were registered between consecutive days of observation, showing the scale of the movement, even during the hiemal season (Fig. 4). MĂTIEȘ (1974b) viewed it as the only resident species and as the most numerous waterbird, mainly during winter. Also, PETRESCU (2005) observed it in August, 2004, while *Mergus merganser* recently appeared in the area, because PETRESCU (2005) had not seen it. Its strengths also varied a lot (Fig. 4), showing again a strong migration. The maximum was recorded in December, but high values also appeared in March and April. During summer, a low number of individuals was recorded. *Phalacrocorax carbo* was the only species observed in every session of survey. In June, July and, mostly, in October, its strength was the highest, but a strong dynamic was also stated. Generally, during summer, the numbers were higher than in winter (Fig. 4), most of them being young (MUNTEANU, 2012). *Ardea cinerea* was poorly represented, with the highest number in the spring passage (Fig. 4). *Larus cachinnans / L. michahellis* was met principally during May and June, respectively February, but, potentially, it can occur all the time, although, probably, rarely (Fig. 4). According to MUNTEANU (2012), *L. cachinnans* is a resident, partially migratory species, an erratic, passage and winter visitor in country, while *L. michahellis* is a breeder in localities and on cliffs, resident, migratory and erratic. According to OLSEN & LARSSON (2004), *Larus cachinnans* moves after breeding towards North-West and West and returns during February-March; *L. michahellis* is mainly sedentary, but many individuals migrate: e.g., the East Mediterranean ones disperse to North-West during July-October, while Central Europe is left from late August-early September. Finally, *Tachybaptus ruficollis* occurred between October and February, with most of the individuals observed in the middle of the winter (Fig. 4). The other species rarely appeared and, generally in low numbers. *Actitis hypoleucos* was observed on August 18, 2022 and February 4, 2023 (1 individual, each), although MĂTIEȘ (1974b) saw here no more than 14 individuals, on April 12-15, 1968, in passage, and much rarely during the breeding season. 3 individuals of *Spatula clypeata* were registered on February 25, 2022, 19 individuals, respectively 7 individuals of *Mareca penelope* were observed on February 18 and March 4, 2023, 458 individuals of *Anser albifrons* flying towards West, also mentioned in passage over the area by MĂTIEȘ (1974b), were observed on November 11, 2023,

1 individual of *Aythya ferina* was spotted on March 4, 2023, 1 individual of *Podiceps cristatus* was seen on February 25, 2023, 1 individual of *Tadorna tadorna* was registered on February 4, respectively March 4, 2023, and 1 individual of *Tringa ochropus* was observed on June 19, 2022, respectively March 26, 2023.

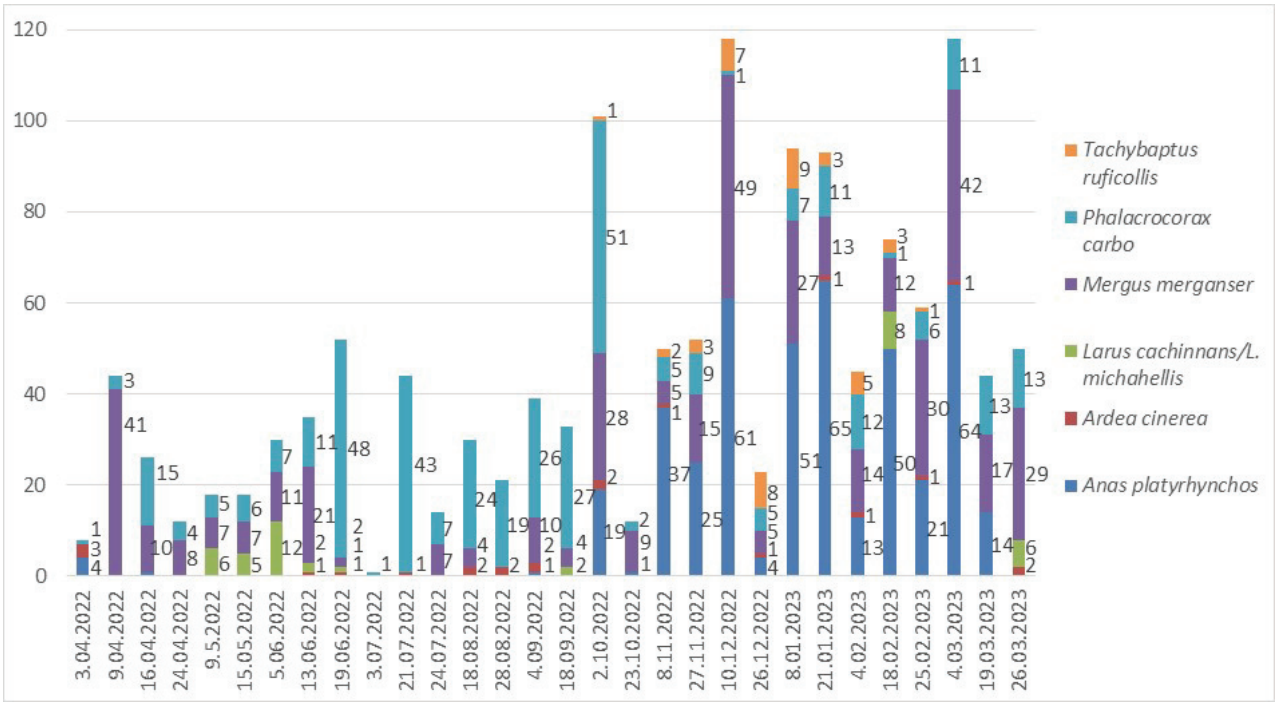

Figure 4. The variation of the strengths for *Tachybaptus ruficollis*, *Phalacrocorax carbo*, *Mergus merganser*, *Larus cachinnans / L. michahellis*, *Ardea cinerea* and *Anas platyrhynchos*.

Regarding the correlations (by ZAMFIRESCU & ZAMFIRESCU, 2008), the highest (moderate and positive) were seen between the strength of *Mareca penelope* and the ice sheet and between the strength of *Larus cachinnans / L. michahellis* and the number of small boats, which can be related with the food originating from the tourists, inclusively fishers. The species also had positive and moderate correlations with the water level and, also, with the number of small chicks of *Mergus merganser*, a potentially food (by comparison, the other species correlated weak or very weak with it). Positive correlations were established between *Actitis hypoleucos*, respectively *Tadorna tadorna* and the snow cover, as well as between the number of waterbird species and the presence of the ice shell, respectively the snow cover. The occurrence of *Tadorna tadorna*, respectively *Actitis hypoleucos* seems to be influenced by the ice bridge, too. Instead, negative and moderate correlations were registered between the number of species, and the strengths of *Mergus merganser*, *Anas platyrhynchos*, respectively *Tachybaptus ruficollis*, on a hand, and the medium watercrafts traveling on the dam basin, on other hand, as well as between the strength of *Mergus merganser* and the number of fishers, that may signify a negative response to the increase in human disturbance. On-site observations showed that the approaching of the tourists determined *M. merganser* (principally females with chicks) to move away in a hurry, while the stationary boats, without humans on board, were ignored. Negative and moderate correlations also appeared between the number of species, the strengths of *M. merganser*, *Anas platyrhynchos*, respectively *Tachybaptus ruficollis* and the temperature of the air measured at 14:00. However, the very weak or weak negative correlations between the overall strengths of the species and the watercrafts transporting tourists, regardless their size, as well as of the fishers, shows that, because of the immensity of the dam basin, the negative impact of the tourists on the waterbirds generally was low. They occurred on the reservoir from April to December, and mainly during June-September, while the fishers occurred mainly during July-August, although there is a temporary prohibition (cf. The Official Monitor of Romania). Also, except for *Larus cachinnans / L. michahellis*, a significant link was not found between the level of water and the occurrence of the birds. As for the ice shell and the depth of the snow cover, they did not obviously affect the species. The correlations were also influenced by the species phenology and biology and they have to be viewed with caution mainly in the case of the taxa represented by few individuals (Table 3).

Table 2. The mean of the number of individuals per day of field researches for every waterbird species and per total as well as the mean of the number of waterbird species a day of observations.

Species	January	February	March	April	May	June	July	August	September	October	November	December	Hiemal	Prevernal	Vernal	Estival	Serotinal	Autumnal	All year
Anser albifrons	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	229	0.0	50.9	0.0	0.0	0.0	0.0	0.0	15.3
Mergus merganser	20.0	18.7	29.3	14.7	7.0	11.3	2.3	2.0	7.0	18.5	10.0	27.0	18.9	21.0	7.0	11.3	2.2	12.7	14.2
Tadorna tadorna	0.0	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1
Aythya ferina	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1
Spatula clypeata	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.1
Mareca penelope	0.0	6.3	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	1.0	0.0	0.0	0.0	0.0	0.9
Anas platyrhynchos	58.0	28.0	26.0	1.2	0.0	0.0	0.0	0.0	0.5	10.0	31.0	32.5	36.3	11.9	0.0	0.0	0.0	5.2	14.4
Tachybaptus ruficollis	6.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	2.5	7.5	4.6	0.0	0.0	0.0	0.0	0.2	1.4
Podiceps cristatus	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1
Ardea cinerea	0.5	0.7	1.0	0.7	0.0	0.7	0.3	2.0	1.0	1.0	0.5	0.5	0.6	0.9	0.0	0.7	1.0	1.0	0.7
Phalacrocorax carbo	9.0	6.3	12.3	5.7	5.5	22.0	17.0	21.5	26.5	26.5	7.0	3.0	6.3	8.6	5.5	22.0	18.8	26.5	13.1
Actitis hypoleucos	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.1
Tringa ochropus	0.0	0.0	0.3	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.3	0.0	0.0	0.1
Larus cachinnans/L. michahellis	0.0	2.7	2.0	0.0	5.5	5.0	0.0	0.0	1.0	0.0	0.0	0.0	0.9	0.9	5.5	5.0	0.0	0.5	1.4
No. individuals	187	203	222	90	36	118	59	52	72	113	560	141	1091	312	36	118	111	185	1853
No. proves (days of field)	2	3	3	4	2	3	3	2	2	2	2	2	9	7	2	3	5	4	30
No. mean individuals a day	93.5	67.7	74.0	22.5	18.0	39.3	19.7	26.0	36.0	56.5	280	70.5	121.2	44.6	18.0	39.3	22.2	46.2	61.8
No. mean of species a day	4.4	6.66	5	2.5	3	4	1.66	3	3.5	4	5	4.5	5.33	3.57	3.00	4.00	2.20	3.75	3.90

Table 3. Correlations between the number of species, respectively their strengths and some anthropogenic and natural variables.

Variables	Small watercrafts	Medium watercrafts	Fishers	Ice shell (%)	Depth of the snow	Water level	Air temperature (14:00)	Small chicks of *M. merganser*
Number of species	-0.16	-0.49	-0.36	0.43	0.44	0.12	-0.60	-0.29
Number of individuals	-0.13	-0.19	-0.20	0.02	0.00	-0.20	-0.22	-0.19
Anser albifrons	-0.07	0.01	-0.09	-0.05	-0.05	-0.18	-0.03	-0.10
Mergus merganser	-0.08	-0.49	-0.41	-0.03	-0.02	0.13	-0.43	-0.26
Tadorna tadorna	-0.10	-0.26	-0.15	0.46	0.62	0.19	-0.37	-0.14
Aythya ferina	-0.07	-0.18	-0.10	-0.05	-0.05	0.16	-0.18	-0.10
Spatula clypeata	-0.07	-0.18	-0.10	-0.05	-0.05	0.13	-0.21	-0.10
Mareca penelope	-0.09	-0.24	-0.14	0.64	0.35	0.13	-0.21	-0.13
Anas platyrhynchos	-0.24	-0.56	-0.36	0.21	0.14	-0.17	-0.63	-0.35
Tachybaptus ruficollis	-0.20	-0.50	-0.30	0.27	0.30	-0.30	-0.64	-0.29
Podiceps cristatus	-0.07	-0.18	-0.10	-0.05	-0.05	0.13	-0.21	-0.10
Ardea cinerea	-0.08	-0.01	0.37	-0.07	-0.01	-0.07	-0.02	-0.17
Phalacrocorax carbo	-0.01	0.20	0.36	-0.13	-0.09	-0.20	0.32	0.18
Actitis hypoleucos	-0.05	0.15	0.14	0.46	0.62	-0.04	0.01	-0.14
Tringa ochropus	-0.05	-0.13	0.00	-0.07	-0.07	0.19	0.16	0.18
L. cachinnans/L. michahellis	0.61	0.17	-0.19	0.24	0.09	0.59	0.17	0.40

While the number of waterbird species observed over more than 50 years raised to 25 species, by comparison with the similar avifauna of Râușoru, 190 ha, also located in the Făgăraș Massif, ca. 850 m a.s.l., where 8 waterbird species were registered during 2005-2007, it does not greatly differ, because the permanent avifauna of the two was very poor, while the one of Vidraru was considered, few decades ago, not proper and stabilised (MUNTEANU & MĂTIEȘ, 1983; PETRESCU, 2005). On Râușoru, *Anas platyrynchos* was the most common species, *Mergus merganser* was seen almost all year, *Tachybaptus ruficollis* occurred only on February and October, while *Podiceps cristatus*, *Phalacrocorax carbo*, *Ardea cinerea*, *Spatula querquedula* and *Bucephala clangula* (Linnaeus, 1758) were rare. *Anas platyrynchos* and *Mergus merganser* were the breeding species (MESTECĂNEANU, 2008).

CONCLUSIONS

The general avifauna. The overall avifauna of the Vidraru Dam Basin, observed between April 2022 and March 2023 using the method of the points of observations, numbered 66 species, so that the list of the species identified in the area, according to the existing scientific literature, rises to 95 species. Among them, 24 species (*Tadorna tadorna*, *Aythya ferina*, *Spatula clypeata*, *Mareca penelope*, *Tachybaptus ruficollis*, *Podiceps cristatus*, *Columba palumbus*, *Tachymarptis melba*, *Apus apus*, *Ardea cinerea*, *Phalacrocorax carbo*, *Tringa ochropus*, *Lophophanes cristatus*, *Poecile palustris*, *Aegithalos caudatus*, *Sylvia atricapilla*, *Ficedula albicollis*, *F. parva*, *Regulus ignicapilla*, *Fringilla montifringilla*, *Coccothraustes coccothraustes*, *Loxia curvirostra*, *Carduelis carduelis*, and *Spinus spinus*) were mentioned for the first time in the area, although other species were personally seen on the place on other occasions, and several were presumably found here by Mătieș. Thus, the real list of the dam basin avifauna easily exceeds 100 species. Passeriformes (with 63.64% of all species recorded by us) was the richest order and Fringillidae (with 12.12% of all species), the richest family. 66.67% of all species were breeding, and the percentage could be higher, if the dryland avifauna is specially envisaged. The certain breeding at the dam of the *Tachymarptis melba* and *Ptyonoprogne rupestris* species in territorial expansion in Europe, and of *Corvus corax*, a natural monument in Romania, on the rocky wall, near the dam, is remarkable. Regarding the phenology, most of the species were mainly considered summer visitors, which means that the dam basin with its forested vicinities, remaining before its construction, were favourable for a lot of species during the warm season. The seasonal dynamics showed a main maximum of the total number of species in the autumnal season and a second peak in the prevernal season, during migration, while the fewest species were recorded in the serotinal and the vernal seasons. Consequently, the high barrier of the Făgăraș Mountains seems to be a surmountable obstacle for many migratory species.

The waterbirds of the dam basin. 14 waterbirds species (*Anser albifrons*, *Mergus merganser*, *Tadorna tadorna*, *Aythya ferina*, *Spatula clypeata*, *Mareca penelope*, *Anas platyrhynchos*, *Tachybaptus ruficollis*, *Podiceps cristatus*, *Ardea cinerea*, *Phalacrocorax carbo*, *Actitis hypoleucos*, *Tringa ochropus*, *Larus cachinnans* / *L. michahellis*) were recorded; 9 of them (*Tadorna tadorna*, *Aythya ferina*, *Spatula clypeata*, *Mareca penelope*, *Tachybaptus ruficollis*, *Podiceps cristatus*, *Ardea cinerea*, *Phalacrocorax carbo* and *Tringa ochropus*, 64.98%) were mentioned for the first time in the area. Also, other species were seen here in time and, therefore, the list of the waterbird species observed on the dam basin, by the cited sources and the present one-year study, reaches 25 species, but, certainly, it can be enriched with more or less accidental species.

The importance of the reservoir from the breeding point of view is still low, as only 1 species, *Mergus merganser*, is a breeder, with a minimum number of 3 pairs (which means 0.3 pairs/100 ha). *Actitis hypoleucos* was not seen as breeding species, although it is likely to be so, at least in some years, while *Anas platyrhynchos* and *Ardea cinerea* have, also, this potential. In time, with the habitat changes induced by the clogging and the global warming, other species can become breeding, and, among them, some current species of passage, which breed in lower zones (*Aythya ferina*, *Podiceps cristatus*) or, even, winter visitors (*Mareca penelope*, *Tachybaptus ruficollis*).

Most of the species were considered mainly species of passage (*Anser albifrons*, *Tadorna tadorna*, *Aythya ferina*, *Spatula clypeata*, *Podiceps cristatus*, *Ardea cinerea*, *Actitis hypoleucos* and *Tringa ochropus*), the area being used by them, except for *Anser albifrons*, which did not stop here, principally as halt during the migration, because, most probably, it does not offer enough food. Also, the dynamics of the species showed obvious migration through the area, although in low numbers, which confirmed the old observations like the Făgăraș Mountains being overflown by the birds in their passage. However, it resulted that the most of them preferred to avoid the highest crests from the North of the dam basin, because the autumn passage was poorer than the spring one, which means that some of the species were laterally deviated in their way by the mountains.

Some aspects regarding the dynamics of the species can also be underlined: *Anas platyrhynchos* attained the highest strengths in some days of observations from January, March and December, *Mergus merganser*, in December, March and April, *Phalacrocorax carbo*, in June, July and, mostly, in October, *Ardea cinerea* in April, *Larus cachinnans / L. michahellis* in June, *Tachybaptus ruficollis* in December and January, but *Anas platyrhynchos*, *Mergus merganser* and *Phalacrocorax carbo* comported ample variations in numbers, showing a strong migration through the area. 1 individual of *Actitis hypoleucos*, generally a summer visitor in Romania, was observed in winter (on February 4, 2023), which could mean an adaptative behaviour to the climate change, while a few individuals of *Spatula clypeata*, *Mareca penelope*, *Aythya ferina*, *Podiceps cristatus*, *Tadorna tadorna* and *Tringa ochropus* were observed in the spring migration. *Anser albifrons* was reconfirmed as autumn migrant species over the Southern Carpathians, with not more less 458 flying individuals towards West, on November 11, 2023.

By comparison with the situation from a few decades ago, a stable avifauna formed on the dam basin, but it is still poor: *Mergus merganser* was the only breeding species and resident, recently appeared in the area, *Ardea cinerea* and *Phalacrocorax carbo* were frequently met all year round and *Anas platyrhyncos* and *Tachybaptus ruficollis*, during the winter.

Several positive but moderate correlations came out between the strength of *Mareca penelope* and the percentage of the ice sheet from the reservoir, the strength of *Larus cachinnans / L. michahellis* and the number of small crafts, the water level, respectively the number of small chicks of *Mergus merganser*, and between the number of waterbird species and the presence of the ice shell, respectively the snow cover, while negative and also moderate correlations were found between the

number of species, the strengths of *Mergus merganser*, *Anas platyrhynchos*, respectively *Tachybaptus ruficollis*, on the one hand, and the medium watercrafts traveling on the dam basin, on other hand, as well as between the strength of *Mergus merganser* and the number of fishers and between the number of species, the strengths of *M. merganser*, *A. platyrhynchos*, respectively *Tachybaptus ruficollis*, on the one hand, and the temperature of the air measured at 14:00, on the other hand, which make us think that there are reasonable relations between the two sets of variables.

At present, because of the immensity of the dam basin, except for *Mergus merganser*, disturbed mainly in the breeding time, the overall negative human impact on the birds was generally low, but the expected development of the tourist facilities on the Transfăgărășan Route, if it is not performed in harmony with the protection of the nature (the more so as the Făgăraș Mountains overlap on the ROSCI0122 Munții Făgăraș), can rise the anthropogenic pression on the birds in the future.

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