ORNITHOLOGICAL RESEARCHES ON THE GOLEŞTI DAM LAKE (ARGEŞ COUNTY, ROMANIA) DURING 2003 – 2010

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Abstract. 199 bird species were observed in the Goleşti Dam Lake, from the middle hydrographical basin of the Argeş River, during 2003 – 2010 (minimum – 64 in January and maximum – 141 in April). Their distribution regarding the constancy, dominancy and Dzuba index of ecological signification were considered. There are two eudominant species (*Anas platyrhynchos* and *Aythya ferina*) and two dominant species (*Aythya fuligula* and *Larus ridibundus*). The variation in the number of individuals during the year is strongly determined by the temperature variation that leads to the diminishing or increasing of the food resources. In winter, when the temperatures were low in the north (and the waters froze), the birds arrived in great number in our area but only a few of them remained in the area for breeding.

Keywords: bird species, ornithological researches, Goleşti Dam Lake, Argeş River, Romania.

INTRODUCTION

On the Argeş River, a chain of dam lakes (Vidraru, Oieşti, Curtea de Argeş, Vâlcele, Bascov, Piteşti, Goleşti) began to be constructed four decades ago. The landscape was strongly modified, the riverside coppice being replaced by large water areas, bordered mainly by long bevels without vegetation. The coppice and the reed beds cover only small parts. As a result, the coenoses suffered significant qualitative and quantitative changes. The first researches were performed in the area in the 1960s [23] but the avifauna of the dam lakes was systematically studied from 1991 [6-8, 11-13, 19, 20].

The Goleşti Dam Lake is part of the Argeş River Dam Lakes (ROSPA0062 – „Lacurile de acumulare de pe Argeş") together with the dam lakes: Zigoneni, Vâlcele, Budeasa, Bascov and Piteşti, a site that is included in the Nature 2000 network [8]. The foundation of the Nature 2000 network is the result of the Habitats Directive and the Birds Directive, legislation that is designed to protect the most threatened habitats and species from Europe [24].

Almost 210 bird species were identified here in the last decades, 118 species being on the list of the Birds Directive and 51 on Annexe I (*Phalacrocorax pygmeus*, *Pelecanus crispus, Ixobrychus minutus, Ardeola ralloides, Egretta garzetta*, *Ciconia nigra*, *Aythya nyroca*, *Cygnus cygnus*, *Branta ruficollis*, *Aquila pomarina*, *Falco columbarius*, *Chlidonias niger, Alcedo atthis, Coracias garrulus, Picus canus*, *Lullula arborea, Anthus campestris, Lanius collurio,* etc.) [6]. The decrease in their population in many European countries takes place at the same time with the degradation of their habitats. These facts imposed special conservation measures [22]. In this context, the artificial wetlands can contribute to this aim [26].

The dam lakes are important because they shelter many other protected species of the fauna [5].

MATERIALS AND METHODS

The Goleşti Dam Lake is placed downstream of Piteşti (Fig. 1). It was built in 1983 mainly for the production of hydro-electric power, the irrigation of the agricultural terrains from the neighbourhood, and for the retention of high water. It is 7866 meters long, it has a surface area of 680 ha and a volume of 78.5 million m^3.

The reservoir is surrounded by a road with restricted traffic (on the concreted talus of the North side). On the South side, the shore consists of ground and gravel; beyond the narrow beach, there is a band of forest of *Quercus* sp. and *Alnus* sp. and a grassed terrain; partially, the dam lake is limitrophe with a recently constructed highway. At the rear part of the lake, the vegetation is relatively poor and it mainly consists of *Alnus* sp., *Populus* sp., *Phragmites australis* and *Typha* sp., *Carex* sp. [2]. The terrains in the vicinity are generally occupied by agricultural crops.

The climate of the area is temperate-continental with cold winters and warm summers [3].

The ornithological researches were conducted between 2003 and 2010. The birds were identified using the Collins Bird Guide [25] and the itinerary and the fixed-point observation methods [4, 15]. We used 10x50 binoculars and 20-60 x 80 telescopes. Complementarily, auditive observations were made. The study was effected mainly in the morning, but observations were also recorded at different moments of the day.

RESULTS

During 2003 – 2010, we observed 199 species of birds, which belong to 17 orders (**Gaviiformes, Podicipediformes**, **Pelecaniformes**, **Ciconiiformes, Anseriformes, Falconiformes, Galliformes, Gruiformes, Charadriiformes, Columbiformes, Cuculiformes, Strigiformes, Caprimulgiformes, Apodiformes**, **Coraciiformes, Piciformes** and **Passeriformes**) and 47 families (Table 1). The orders represent 89.49% of the total orders of the Romanian

avifauna, the families represent 73.43% and the species represent 52.09% [21]. The best represented are the orders **Passeriformes** (86 species, 43.21% of all the observed species in the Goleşti Dam Lake), **Charadriiformes** (27 species, 13.56%), **Anseriformes** (19 species, 9.54%) and **Falconiformes** (16 species, 8.04%).

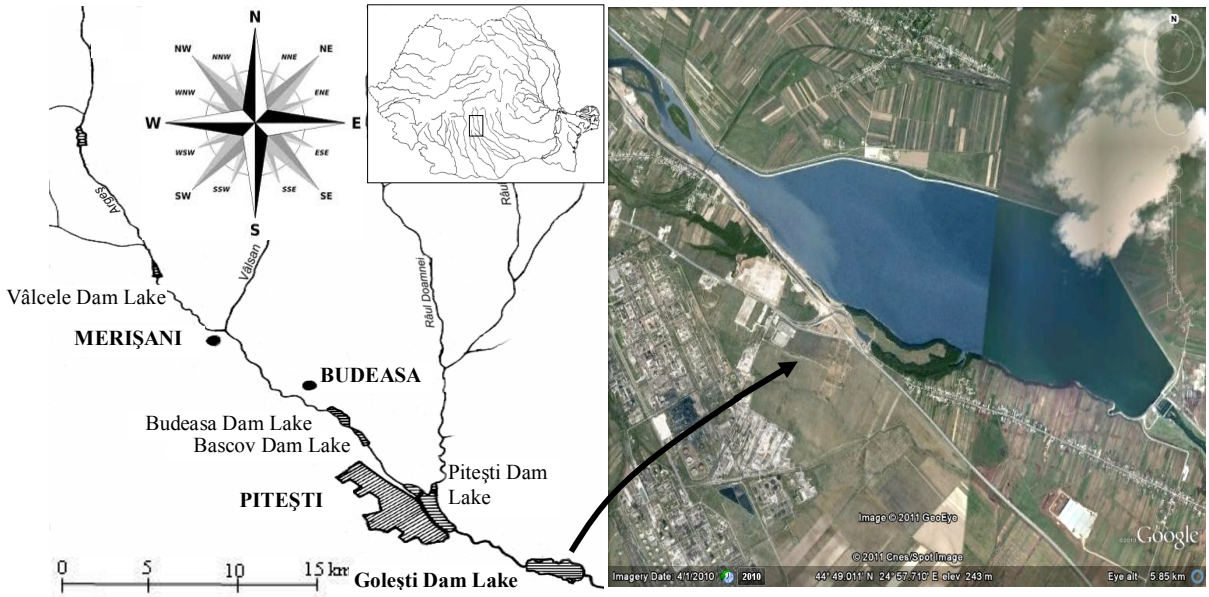

Figure 1. The upper and middle hydrographical basin of the Argeş River with the satellite image of the Goleşti Dam Lake.

Table 1. The list of the bird species identified in the Goleşti Dam Lake during 2003 – 2010

No.	Species	January	February	March	April	May	June	July	August	September	October	November	December	Constancy	Dominancy	Dzuba index	Birds Directive
1.	*Gavia arctica*	■	■								■		■	14.44	0.01	0.01	AI
2.	*Gavia stellata*											■	■	2.22	0.01	0.01	AI
3.	*Podiceps cristatus*	■	■	■	■	■	■	■	■	■	■	■	■	93.33	0.37	0.35	
4.	*Podiceps grisegena*						■	■						4.44	0.01	0.01	
5.	*Podiceps nigricollis*	■	■	■	■	■	■	■		■	■	■	■	48.89	0.03	0.02	
6.	*Tachybaptus ruficollis*	■	■	■	■	■	■	■	■	■	■	■	■	72.22	0.29	0.21	
7.	*Phalacrocorax carbo*	■	■	■	■	■	■	■	■	■	■	■	■	96.67	1.63	1.57	
8.	*Phalacrocorax pygmeus*	■	■	■	■	■	■	■	■	■	■	■	■	32.22	0.05	0.02	AI
9.	*Pelecanus crispus*						■		■	■				3.33	0.01	0.01	AI
10.	*Ixobrychus minutus*				■	■	■	■	■	■				40.01	0.03	0.01	AI
11.	*Egretta garzetta*			■	■	■	■	■	■	■	■			50.01	0.10	0.05	AI
12.	*Egretta alba*	■	■	■								■	■	28.89	0.02	0.01	AI
13.	*Ardeola ralloides*									■				2.22	0.01	0.01	AI
14.	*Ardea cinerea*	■	■	■	■	■	■	■	■	■	■	■	■	75.56	0.06	0.05	
15.	*Ardea purpurea*				■	■			■					6.67	0.01	0.01	AI
16.	*Platalea leucorodia*								■	■				3.33	0.01	0.01	AI
17.	*Nycticorax nycticorax*				■	■	■	■	■	■	■			28.89	0.03	0.01	AI
18.	*Ciconia ciconia*						■	■						8.89	0.01	0.01	AI
19.	*Ciconia nigra*					■	■							5.56	0.01	0.01	AI
20.	*Cygnus olor*	■	■	■	■	■	■	■	■	■	■	■	■	92.22	0.49	0.46	AII/B
21.	*Cygnus cygnus*	■	■										■	12.22	0.02	0.01	AI
22.	*Anser albifrons*	■	■								■	■	■	17.78	0.87	0.15	AII/B, AIII/B
23.	*Anas platyrhynchos*	■	■	■	■	■	■	■	■	■	■	■	■	100.01	46.48	46.48	AII/A, AIII/A
24.	*Anas strepera*					■				■				3.33	0.01	0.01	AII/A
25.	*Anas acuta*		■									■	■	7.78	0.01	0.01	AII/A, AIII/B
26.	*Anas penelope*	■	■		■					■	■	■	■	27.78	0.24	0.07	AII/A, AIII/B
27.	*Anas querquedula*			■	■	■	■	■	■	■	■		■	47.78	0.25	0.12	AII/A
28.	*Anas crecca*	■	■	■	■	■	■	■	■	■	■	■	■	96.67	4.20	4.06	AII/A, AIII/B
29.	*Anas clypeata*			■	■			■		■	■			10.01	0.02	0.01	AII/A, AIII/B

30.	*Tadorna tadorna*		■							■		■	■	14.44	0.03	0.01	
31.	*Netta rufina*			■										1.11	0.01	0.01	AII/B
32.	*Aythya marila*		■									■	■	4.44	0.01	0.01	AII/B, AIII/B
33.	*Aythya fuligula*	■	■	■	■	■	■	■	■	■	■	■	■	96.67	6.95	6.72	AII/A, AIII/B
34.	*Aythya ferina*	■	■	■	■	■	■	■	■	■	■	■	■	100.01	16.49	16.49	AII/A, AIII/B
35.	*Aythya nyroca*				■	■		■	■	■		■		12.22	0.01	0.01	AI
36.	*Bucephala clangula*	■	■	■								■	■	28.89	0.18	0.05	AII/B
37.	*Mergus merganser*		■										■	4.44	0.01	0.01	AII/B
38.	*Mergus albellus*	■	■	■								■	■	22.22	0.02	0.01	AI
39.	*Aquila pomarina*				■					■				4.44	0.01	0.01	AI
40.	*Circaetus gallicus*			■										1.11	0.01	0.01	AI
41.	*Buteo lagopus*		■	■								■		4.44	0.01	0.01	
42.	*Buteo buteo*	■	■	■	■	■	■	■	■	■	■	■	■	61.11	0.02	0.02	
43.	*Pernis apivorus*				■						■			4.44	0.01	0.01	AI
44.	*Accipiter gentilis*			■	■	■		■	■	■	■		■	22.22	0.01	0.01	
45.	*Accipiter nisus*		■		■	■		■	■	■	■	■	■	30.01	0.01	0.01	
46.	*Accipiter brevipes*				■		■			■	■			6.67	0.01	0.01	AI
47.	*Circus aeruginosus*					■	■	■	■	■				22.22	0.01	0.01	AI
48.	*Circus cyaneus*	■	■									■	■	11.11	0.01	0.01	AI
49.	*Circus pygargus*				■						■			2.22	0.01	0.01	AI
50.	*Falco peregrinus*			■										1.11	0.01	0.01	AI
51.	*Falco subbuteo*					■	■	■	■	■				21.11	0.01	0.01	
52.	*Falco columbarius*		■										■	8.89	0.01	0.01	AI
53.	*Falco vespertinus*				■					■				4.44	0.01	0.01	AI
54.	*Falco tinnunculus*	■	■	■	■	■	■	■	■	■	■	■	■	54.44	0.02	0.01	
55.	*Perdix perdix*		■	■	■	■		■	■	■	■	■	■	23.33	0.02	0.01	AII/A, AIII/A
56.	*Phasianus colchicus*		■	■	■	■	■	■	■	■	■	■	■	28.89	0.01	0.01	AII/A, AIII/A
57.	*Coturnix coturnix*				■	■	■	■	■					34.44	0.03	0.01	AII/B
58.	*Rallus aquaticus*				■	■	■	■	■					18.89	0.01	0.01	AII/B
59.	*Porzana porzana*				■	■		■	■					6.67	0.01	0.01	AI
60.	*Crex crex*							■						2.22	0.01	0.01	AI
61.	*Gallinula chloropus*		■	■	■	■	■	■	■	■	■	■		58.89	0.07	0.04	AII/B
62.	*Fulica atra*	■	■	■	■	■	■	■	■	■	■	■	■	98.89	4.90	4.85	AII/A, AIII/B
63.	*Vanellus vanellus*		■	■	■	■	■	■	■	■	■			52.22	0.11	0.06	AII/B
64.	*Charadrius dubius*				■	■	■	■	■					14.44	0.01	0.01	
65.	*Pluvialis apricaria*				■									1.11	0.01	0.01	AI, AII/B, AIII/B
66.	*Scolopax rusticola*			■							■			2.22	0.01	0.01	AII/A, AIII/B
67.	*Galinago media*	■	■											2.22	0.01	0.01	AI
68.	*Galinago gallinago*				■					■				6.67	0.01	0.01	AII/A, AIII/B
69.	*Numenius arquata*								■	■				2.22	0.01	0.01	AII/B
70.	*Limosa limosa*				■	■		■	■					6.67	0.01	0.01	AII/B
71.	*Calidris minuta*				■	■			■					6.67	0.01	0.01	
72.	*Calidris temmincki*					■				■				2.22	0.01	0.01	
73.	*Actitis hypoleucos*				■	■		■	■	■	■			17.78	0.01	0.01	
74.	*Tringa ochropus*	■			■	■			■	■				16.67	0.01	0.01	
75.	*Tringa glareola*				■			■	■	■				18.89	0.02	0.01	AI
76.	*Tringa nebularia*				■	■		■	■	■				8.89	0.01	0.01	AII/B
77.	*Tringa totanus*								■					3.33	0.01	0.01	AII/B
78.	*Tringa erythropus*				■			■	■	■				5.56	0.01	0.01	AII/B
79.	*Tringa stagnatilis*				■				■					4.44	0.01	0.01	
80.	*Philomachus pugnax*				■		■	■	■					6.67	0.01	0.01	AI, AII/B
81.	*Himantopus himantopus*				■	■	■	■	■	■				24.44	0.01	0.01	AI
82.	*Larus cachinnans/michahellis*	■	■	■	■	■	■	■	■	■	■	■	■	98.89	2.00	1.98	AII/B
83.	*Larus canus*	■	■	■							■	■		36.67	0.98	0.36	AII/B
84.	*Larus ridibundus*	■	■	■	■	■	■	■	■	■	■	■	■	97.78	5.71	5.58	AII/B
85.	*Larus minutus*				■	■		■	■			■		15.56	0.01	0.01	AI
86.	*Chlidonias niger*				■	■	■	■	■	■				23.33	0.02	0.01	AI
87.	*Chlidonias leucopterus*				■				■	■				6.67	0.01	0.01	
88.	*Chlidonias hybridus*				■	■	■	■	■	■				28.89	0.02	0.01	AI
89.	*Sterna hirundo*				■	■	■	■	■	■				44.44	0.05	0.02	AI

90.	*Columba oenas*				■					■				2.22	0.01	0.01	AII/B
91.	*Columba palumbus*				■	■	■	■		■	■			7.78	0.01	0.01	AII/A, AIII/A
92.	*Streptopelia turtur*				■	■	■	■	■					21.11	0.01	0.01	AII/B
93.	*Streptopelia decaocto*		■	■	■	■	■	■	■	■	■	■	■	71.11	0.08	0.06	AII/B
94.	*Cuculus canorus*				■	■	■	■						26.67	0.01	0.01	
95.	*Otus scops*					■	■	■	■					10.01	0.01	0.01	
96.	*Athene noctua*		■		■	■	■		■		■	■	■	22.22	0.01	0.01	
97.	*Strix aluco*					■		■						3.33	0.01	0.01	
98.	*Asio otus*		■		■				■	■		■		7.78	0.01	0.01	
99.	*Caprimulgus europaeus*				■	■	■							12.22	0.01	0.01	AI
100.	*Apus apus*					■	■	■	■	■				21.11	0.05	0.01	
101.	*Alcedo atthis*	■	■		■	■	■	■	■	■	■	■	■	53.33	0.02	0.01	AI
102.	*Merops apiaster*					■	■	■						10.01	0.01	0.01	
103.	*Coracias garrulus*				■		■							3.33	0.01	0.01	AI
104.	*Upupa epops*				■	■	■	■						15.56	0.01	0.01	
105.	*Picus viridis*	■	■	■	■	■	■	■	■	■	■	■	■	31.11	0.01	0.01	
106.	*Picus canus*		■		■	■	■	■			■	■	■	15.56	0.01	0.01	AI
107.	*Dedrocopos major*		■	■	■	■	■	■	■	■	■	■	■	34.44	0.01	0.01	
108.	*Dendrocopos syriacus*	■	■	■	■	■	■	■	■	■	■	■	■	48.89	0.01	0.01	AI
109.	*Dendrocopos medius*	■	■	■	■	■	■			■			■	15.56	0.01	0.01	AI
110.	*Dendrocopos minor*	■	■	■	■	■	■	■	■	■	■	■		21.11	0.01	0.01	
111.	*Dendrocopos leucotos*		■									■	■	4.44	0.01	0.01	AI
112.	*Dryocopus martius*					■		■			■			3.33	0.01	0.01	AI
113.	*Jynx torquilla*				■	■	■	■	■					17.78	0.01	0.01	
114.	*Galerida cristata*	■	■	■	■	■	■	■	■	■	■	■	■	57.78	0.07	0.04	
115.	*Alauda arvensis*		■	■	■	■	■	■	■	■	■	■	■	58.89	0.09	0.05	AII/B
116.	*Lullula arborea*				■	■	■	■	■	■				23.33	0.01	0.01	AI
117.	*Riparia riparia*					■	■	■	■	■				21.11	0.03	0.01	
118.	*Hirundo rustica*				■	■	■	■	■	■				46.67	0.59	0.27	
119.	*Delichon urbica*				■	■	■	■	■	■				36.67	0.19	0.07	
120.	*Anthus trivialis*			■	■	■	■	■	■	■				30.01	0.01	0.01	
121.	*Anthus campestris*				■	■	■	■	■	■				21.11	0.01	0.01	AI
122.	*Anthus spinoletta*	■	■	■								■	■	25.56	0.01	0.01	
123.	*Motacilla flava*			■	■	■	■	■	■	■				51.11	0.09	0.04	
124.	*Motacilla cinerea*	■	■	■							■	■	■	24.44	0.01	0.01	
125.	*Motacilla alba*	■	■	■	■	■	■	■	■	■	■	■	■	71.11	0.14	0.10	
126.	*Lanius collurio*				■	■	■	■	■	■	■			36.67	0.02	0.01	AI
127.	*Lanius minor*					■	■	■	■					10.01	0.01	0.01	AI
128.	*Lanius excubitor*	■	■			■	■	■				■	■	17.78	0.01	0.01	
129.	*Oriolus oriolus*				■	■	■	■	■					28.89	0.01	0.01	
130.	*Sturnus vulgaris*		■	■	■	■	■	■	■	■	■			61.11	1.07	0.65	AII/B
131.	*Bombycilla garrulus*		■									■		2.22	0.01	0.01	
132.	*Garrulus glandarius*	■	■	■	■	■	■	■	■	■	■	■	■	56.67	0.02	0.01	AII/B
133.	*Pica pica*	■	■	■	■	■	■	■	■	■	■	■	■	85.56	0.12	0.10	AII/B
134.	*Corvus monedula*	■	■	■	■	■	■	■	■	■	■	■	■	83.33	0.88	0.74	AII/B
135.	*Corvus frugilegus*	■	■	■	■	■	■	■	■	■	■	■	■	92.22	1.20	1.10	AII/B
136.	*Corvus corone cornix*	■	■	■	■	■	■	■	■	■	■	■	■	31.11	0.04	0.01	AII/B
137.	*Corvus corax*	■	■	■	■		■	■	■	■	■	■	■	33.33	0.01	0.01	
138.	*Troglodytes troglodytes*	■	■	■	■	■	■	■	■	■	■	■	■	46.67	0.02	0.01	
139.	*Prunella modularis*									■				6.67	0.01	0.01	
140.	*Locustella luscinioides*				■	■	■	■	■	■				24.44	0.01	0.01	
141.	*Locustella fluviatilis*				■	■	■	■	■	■				15.56	0.01	0.01	
142.	*Locustella naevia*							■						1.11	0.01	0.01	
143.	*Acrocephalus schoenobaenus*			■	■	■	■	■	■	■				51.11	0.05	0.03	
144.	*Acrocephalus palustris*				■	■	■	■	■	■				48.89	0.04	0.02	
145.	*Acrocephalus scirpaceus*			■	■	■	■	■	■	■				48.89	0.03	0.02	
146.	*Arocephalus arundinaceus*			■	■	■	■	■	■	■				50.01	0.03	0.01	
147.	*Hippolais icterina*				■	■				■				6.67	0.01	0.01	
148.	*Sylvia nisoria*					■	■		■	■				5.56	0.01	0.01	AI
149.	*Sylvia borin*				■	■	■	■						13.33	0.01	0.01	

150.	*Sylvia atricapilla*				■	■	■	■	■	■	■			43.33	0.01	0.01	
151.	*Sylvia communis*				■	■	■	■	■	■				44.44	0.02	0.01	
152.	*Sylvia curruca*			■	■	■	■	■	■	■	■			42.22	0.03	0.01	
153.	*Phylloscopus collybita*			■	■	■	■	■	■	■	■			58.89	0.06	0.04	
154.	*Phylloscopus sybilatrix*					■			■	■				5.56	0.01	0.01	
155.	*Phylloscopus trochilus*			■	■					■	■			5.56	0.01	0.01	
156.	*Regulus regulus*		■									■	■	6.67	0.01	0.01	
157.	*Regulus ignicapillus*												■	1.11	0.01	0.01	
158.	*Ficedula hypoleuca*				■	■			■	■				11.11	0.01	0.01	
159.	*Ficedula parva*					■								5.56	0.01	0.01	AI
160.	*Ficedula albicollis*				■	■	■	■	■					21.11	0.01	0.01	AI
161.	*Muscicapa striata*				■	■	■	■	■					22.22	0.01	0.01	
162.	*Oenanthe oenanthe*				■	■	■	■	■					28.89	0.01	0.01	
163.	*Saxicola rubetra*				■	■	■			■				8.89	0.01	0.01	
164.	*Saxicola torquata*			■	■	■	■	■	■					18.89	0.01	0.01	
165.	*Phoenicurus phoenicurus*			■	■	■	■		■	■				13.33	0.01	0.01	
166.	*Phoenicurus ochruros*				■	■	■	■	■	■				25.56	0.01	0.01	
167.	*Erithacus rubecula*	■	■	■	■	■	■	■	■	■	■	■	■	47.78	0.02	0.01	
168.	*Lucsinia luscinia*					■	■							4.44	0.01	0.01	
169.	*Luscinia megarhynchos*				■	■	■	■	■	■				34.44	0.01	0.01	
170.	*Turdus merula*	■	■	■	■	■	■	■	■	■	■	■	■	68.89	0.04	0.03	AII/B
171.	*Turdus iliacus*			■	■						■		■	6.67	0.01	0.01	AII/B
172.	*Turdus philomelos*			■	■	■	■	■	■		■			27.78	0.01	0.01	AII/B
173.	*Turdus viscivorus*	■	■	■	■	■	■	■	■		■	■	■	43.33	0.04	0.02	AII/B
174.	*Turdus pilaris*	■	■	■	■	■	■	■	■	■		■	■	36.67	0.07	0.03	AII/B
175.	*Parus palustris*	■	■	■	■	■	■		■		■	■	■	23.33	0.02	0.01	
176.	*Parus lugubris*			■						■		■	■	5.56	0.01	0.01	
177.	*Parus caeruleus*	■	■	■	■	■	■	■	■	■	■	■	■	73.33	0.05	0.04	
178.	*Parus ater*		■		■						■		■	7.78	0.01	0.01	
179.	*Parus major*	■	■	■	■	■	■	■	■	■	■	■	■	83.33	0.09	0.07	
180.	*Aegithalos caudatus*		■	■	■		■		■			■	■	14.44	0.01	0.01	
181.	*Remiz pendulinus*				■	■		■	■					6.67	0.01	0.01	
182.	*Sitta europaea*	■	■	■	■	■	■	■	■	■	■	■	■	52.22	0.02	0.01	
183.	*Certhia familiaris*			■	■	■	■	■	■					14.44	0.01	0.01	
184.	*Passer domesticus*	■	■	■	■	■	■	■	■	■	■	■	■	67.78	0.28	0.19	
185.	*Passer montanus*	■	■	■	■	■	■	■	■	■	■	■	■	75.56	0.44	0.33	
186.	*Fringilla coelebs*	■	■	■	■	■	■	■	■	■	■	■	■	80.01	0.10	0.08	
187.	*Fringilla montifringilla*	■	■									■	■	11.11	0.02	0.01	
188.	*Pyrrhula pyrrhula*	■	■	■	■					■	■	■	■	22.22	0.01	0.01	
189.	*Coccothraustes coccothraustes*	■	■	■	■	■	■	■	■	■	■	■	■	45.56	0.02	0.01	
190.	*Serinus serinus*				■	■	■	■				■		7.78	0.01	0.01	
191.	*Carduelis chloris*	■	■	■	■	■	■	■	■	■	■	■	■	54.44	0.04	0.02	
192.	*Carduelis spinus*	■	■	■								■	■	23.33	0.09	0.02	
193.	*Carduelis carduelis*	■	■	■	■	■	■	■	■	■	■	■	■	81.11	0.19	0.16	
194.	*Carduelis cannabina*	■	■		■	■	■	■	■	■		■	■	40.01	0.04	0.02	
195.	*Emberiza cia*		■									■	■	6.67	0.01	0.01	
196.	*Emberiza schoeniclus*	■	■	■	■	■	■	■	■	■	■	■	■	72.22	0.03	0.02	
197.	*Emberiza cirlus*		■										■	3.33	0.01	0.01	
198.	*Miliaria calandra*		■	■	■	■	■	■	■	■	■		■	50.01	0.04	0.02	
199.	*Emberiza citrinella*	■	■	■	■	■	■	■	■	■	■	■	■	64.44	0.09	0.06	
Number of species		64	89	90	141	136	121	127	127	123	81	83	89				

Note: AI – species that need special conservation measures of their habitat, to assure their survival and their reproduction in their distribution area, AII/A – species that may be chased in the maritime or geographic zone of application for the Birds Directive, enumerated in Annexe II, part A; AII/B – species that may be chased only in the Member States for which they are mentioned, enumerated in Annexe II, part B; AIII/A – species for which the sale, transport for sale, keeping for sale and the offering for sale of live or dead birds and of any readily recognisable parts or derivatives of such birds are permitted (provided that the birds have been legally killed or captured or otherwise legally acquired).

Regarding the constancy, most species were accidental species (C1, 115 species, 57.79%). They were followed by accessory species (C2, 44 species, 22.11%), constant species (C3, 22 species, 11.06%) and euconstant species (C4, 18 species, 9.05%) (Table 1, Fig. 2).

Regarding the dominancy, the most species were subrecedent species (D1, 190 species, 95.48%). The 2

recedent species (D2) constituted 1.01 of all the species, the 3 subdominant species (D3) constituted 1.51%, the 2 dominant species (D4) constituted 1.01% and the 2 eudominant species (D5) constituted only 1.01% of all the identified species (Table 1, Fig. 3).

Regarding the Dzuba index of ecological signification, most species were subrecedent species (W1, 177 species, 88.94%). They were followed by recedent species (W2, 13 species, 6.53%), subdominant species (W3, 5 species, 2.51%), dominant (W4) and eudominant species (W5), each with 2 species and 1.01% (Table 1, Fig. 4).

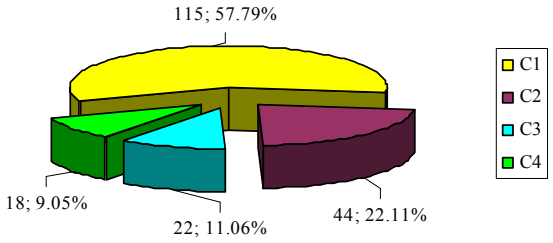

Figure 2. The distribution of the bird species according to constancy. C1 – accidental species, C2 – accessory species, C3 – constant species, C4 – euconstant species.

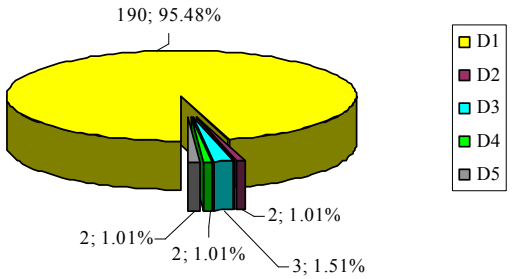

Figure 3. The distribution of the bird species according to dominancy. D1 – subrecedent species, D2 – recedent species, D3 – subdominant species, D4 – dominant species, D5 – eudominant species.

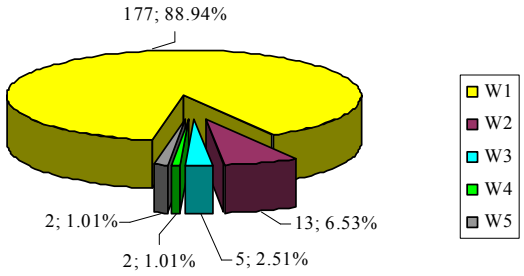

Figure 4. The distribution of the bird species according to Dzuba index of ecological significance. W1 – subrecedent species, W2 – recedent species, W3 – subdominant species, W4 – dominant species, W5 – eudominant species

Taking into account the variation in the number of individuals of the 2 eudominant species (*Anas platyrhynchos* and *Aythya ferina*) and of the 2 dominant species (*Aythya fuligula* and *Larus ridibundus*) counted each month at one field observation during 2003 – 2010 (Table 2, Fig. 5), we remarked that the highest values were reached in December. *Larus ridibundus* was the exception, its maximum number of individuals being observed in February. The July – March period was, generally, well represented from this point of view. In the case of *Anas platyrhynchos*, a high value of the counted individuals was also registered in February; in January and in November the number of individuals was a bit lesser. The situation was similar for the *Aythya ferina* and A*ythya fuligula*, with the mention that the recorded figures were obviously smaller.

100 species are in the annexes of the Bird Directive (Directive 2009/147/EC [27]); 52 of them (52%) are in Annexe I being species that need special conservation measures of their habitat, to assure their survival and their reproduction in their distribution area (Table 1).

DISCUSSIONS

The species richness of the Goleşti Dam Lake is the result of more factors: the abundant food supply, the great surface of the dam lake, the varied habitats from the vicinity, the relative shelter against human disturbance, the position on the course of the Argeş River, at about 120 km from the course of the Danube River and on the Turnu Roşu – Cozia and Bran – Rucăr routes of migration, the temperate-continental climate, etc. [6, 16, 18].

At the level of the avifauna of all the dam lakes on the Argeş River studied during 2003 – 2010 (Vâlcele, Budeasa, Bascov, Piteşti and Goleşti), we identified the majority of them (90%) in the Goleşti Dam Lake. Thus, among the species that depend on water, *Branta ruficollis*, *Anser anser*, *Melanitta fusca*, *Haliaeetus albicilla*, *Calidris alpina* were not observed here but they will probably be observed here in the future (*Branta ruficollis* being already observed in 2011 – 20 individuals on 25 November, personal observations).

The percent distribution of the main orders of birds is close to one of the general level (**Passeriformes**, 42.5%, **Charadriiformes**, 13.5%, **Anseriformes**, 10.6% and **Falconiformes,** 8.2%, this fact showing that is a great likeness between the avifauna of the two areas [6].

We observe that the lowest number of species was recorded from October to March (between 64 – in January, and 90 – in March), and the highest number was in April (141) and May (136), during the spring passage. In the autumn passage, the number of the observed species was smaller (Table 1). In the rest of the months, the number of species was also large, suggesting that the area is favourable for many species of birds (few of them breed here and many come here from the vicinities for food). The variation of the number of species during the year (inclusively of Anseriformes) is caused mainly by the position of the dam lake on the two ways of passage (Bran – Rucăr and Turnu Roşu – Cozia), as we said earlier. The connection with the Danube River through the middle and inferior course of the Argeş River (that facilitated the apparition of *Pelecanus crispus*, *Platalea leucorodia* and other species) has had a major role, too. Also, the place of the Goleşti Dam Lake in the Roma-

Table 2. The monthly number of individuals for the eudominant and dominant species registered during 2003 - 2010

No.	Species	January	February	March	April	May	June	July	August	September	October	November	December	Total
1	*Anas platyrhynchos*	31975	37900	22920	3150	1222	1596	2300	4350	7700	13280	31800	42350	200543
2	*Aythya fuligula*	834	4650	2380	530	249	270	420	1014	1805	3320	6590	7930	29992
3	*Aythya ferina*	2790	7820	4070	1308	1205	1440	1910	2770	6367	10446	14340	17100	71566
4	*Larus ridibundus*	2393	4163	2050	995	380	695	1642	2448	1719	2190	2680	3080	24435

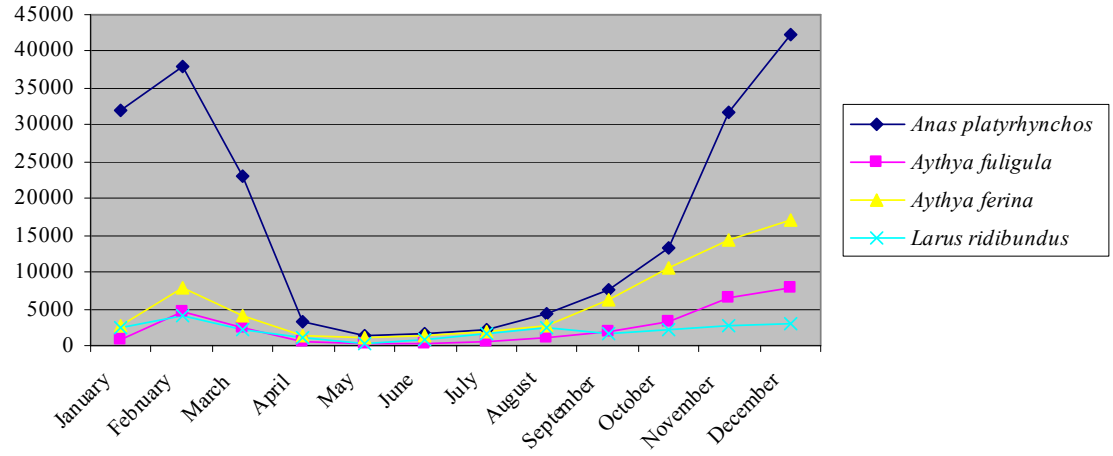

Figure 5. The evolution of the individuals of eudominant and dominant species identified during 2003 – 2010 in the Goleşti Dam Lake

nian Plain makes the movement of the birds between the Argeş River and the other hydrographical basins from the region (Olt, Vedea, Teleorman, Dambovita and Ialomiţa) easier. As a result, in the Goleşti Dam Lake the variation in the number of individuals was greater than the ones in the Piteşti, Bascov, Budeasa and Vâlcele dam lakes, for example, from the upstream hilly area [6].

Regarding the number of individuals, the best represented is the order Anseriformes. This situation was also observed in other wetland regions: the Big Lake Natural Area, in Alberta, in the migratory period, the Sorkhrud International Wetland, in Iran, during the whole year, etc., due to the presence in huge numbers of some species (the most frequently, *Anas platyrhynchos*) that found here good condition for feeding, breeding, migration and wintering [1, 10].

We remarked that there are few species with significant values of constancy, dominancy and Dzuba index. These species (*Anas platyrhynchos*, *Aythya ferina*, *Aythya fuligula* and *Larus ridibundus*) have a large ecological valence (being present in many types of wetland regions), or have here abundant food and a good place to rest. They are present here during the whole year, in winter, with a spectacular number of individuals. The important numbers of the accidental, recedent or subrecedent species suggest that in the area there is a big number of species that came here rarely and in small numbers in the passage period or in the winter season. Also, certain species came here in search of food from the neighbouring areas; other species breed here in small numbers and have a hidden life. By comparison, the ornithological observations conducted during the six ecological seasons by Munteanu and Mătieş (in the area of the Goleşti Dam Lake) reveal the main percentages of the individuals of *Anas platyrhynchos*, *Anas crecca*, *Vanellus vanellus*, and *Larus ridibundus* [21]. The differences in results between these researches and our researches are determined by the time elapsed between them, a period marked by the gradual eutrophication and silting of the dam lakes (with their consequences) and, equally by the different utilisation of the adjacent agricultural terrains and pastures.

Regarding the variation in the number of individuals in winter, we can say that it is strongly determined by the variation of the temperatures that leads to the decrease or increase in food resources.

So, when the temperatures were low in the north (and the waters froze), the birds arrived in great numbers in our area. In other situations, when the temperatures decreased below 0^0C for many days in our area and large areas of the water surface froze, the birds were forced to fly southward (generally in January, less in February). In spring, when the temperatures began to increase, most of the individuals left the dam lakes on the Argeş River to breed in the north. In the case of *Anas platyrhynchos*, there is a huge difference between the number of individuals recorded in the winter season and the number of individuals recorded during the vernal, aestival and serotinal seasons and only a small part of the hiemal number of individuals remains in the area for breeding. An analogous situation is for *Aythya ferina*. Considering their occurrence over the year, probably *Aythya fuligula* and *Larus ridibundus* breed in the area.

The hunting pressure can play a particular role in the variation in the number of individuals, too [9].

Concerning the protected species, we can also refer to the Bonn Convention on migratory species. *Pelecanus crispus*, *Branta ruficollis* and *Aythya nyroca* are in its Annex I (migratory species threatened with extinction). In the Red List of Vertebrates of Romania, there are more species (*Phalacrocorax pygmeus*, *Pelecanus crispus*, *Egretta garzetta*, *Egretta alba*, *Ardeola ralloides*, *Ardea purpurea*, *Platalea leucorodia*, *Nycticorax nycticorax*, *Ciconia ciconia*, *Ciconia nigra*, *Branta ruficollis*, *Tadorna tadorna*, *Netta rufina*, *Aythya nyroca*, *Bucephala clangula*, *Mergus albellus*, etc.) [5]. All the protected species need real protection measures. In this context, in the wetland management, from the managing applications standpoint, the ethical principles are very important, too. Fundamentally, three principles can be specified: solidarity, respect for the natural environment, and responsibility for the next generations [14, 17].

The results obtained during the researches conducted in the period 2003 – 2010 in the Goleşti Dam Lake led us to the conclusion that the area is important for birds throughout the year. They have here good places for feeding, breeding and refuge. The dam lake also represents an important winter quarter for many species of birds, mainly for *Anas platyrhynchos*, *Aythya ferina*, *Aythya fuligula* and *Larus ridibundus*. Generally in summer, there are many species of birds with few individuals and in winter there are few species of birds with many individuals.

Therefore, the Goleşti Dam Lake offers optimal living conditions for a few eudominant and dominant species (especially in the passage time and in the hiemal season), species that prefer a wide variety of wetlands. The number of individuals depends on the weather conditions, the expanse of the water surface, the accessibility of the trophic supplies, the anthropogenic pressure, the heterogeneity of the landscape, etc.

Our researches contribute to a good knowledge of the birds in the area, particularly of the hydrographical basin of the Argeş River. Together with the conjugated actions of the Romanian Ornithological Society, they led to the declaration of the Argeş River Dam Lakes as part of the Nature 2000 Network in Romania and this fact is entirely justified if we take into account the big number of individuals and rare and protected species observed here each year.

The area needs efficient and concrete measures of conservation for birds and their habitats.

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