

ASPECTS REGARDING THE DIVERSITY OF THE BIRD FAUNA IN THE PERIMETER OF SOME RESERVOIRS ON THE VALLEY OF SIRET RIVER (BACĂU COUNTY, ROMANIA)

Mădălina-Elena ROȘU*, Ioana-Gabriela FILIPIUC, Carmen GACHE

“Alexandru Ioan Cuza” University of Iași, 11A Av. Carol I, 700505, Iași, Romania

KEYWORDS	ABSTRACT
Bird species Diversity Siret River Status Trends	In this study, we present the results of our monitoring activity on the bird fauna of three reservoirs (Galbeni, Răcăciuni and Berești), located in the middle basin of Siret River and part of ROSPA0063 Buhuși – Bacău – Berești Nature 2000 site. Our study began in June 2022 and ended in May 2023, following the dynamic of bird fauna during the breeding season, migration, and wintering time. We identified 152 bird species in the investigated area, and we present quantitative data for each studied reservoir. The breeding populations are small, but these three reservoirs shelter significant waterfowl population during the migration and wintering time. We notice the relevance of this territory as flyway for white stork (<i>Ciconia ciconia</i>) and raptor birds (Accipitriformes, Falconiformes) in the eastern Romania. We mention the presence of 39 protected bird species through Annex 1 of Birds' Directive. We recorded 30 bird species mentioned in the Romanian Red Book of Vertebrates, including four which are considered critically endangered bird species: <i>Pelecanus crispus</i> , <i>Haliaeetus albicilla</i> , <i>Clanga clanga</i> , and <i>Milvus migrans</i> . We also give data about trends of the bird species in comparison with similar studies done more than two decades ago in this perimeter. We identified the main threatening risks for the bird fauna, and we assess the level of anthropogenic impact on the presence of bird species in the area.

INTRODUCTION

Siret River has its source in the Carpathian Mountains, specifically the Bukovinian Subcarpathians (Cernăuți area, Ukraine), and enters Romania's territory through Siret City. The river has a total length of 647 km (559 km within Romania's territory) and it is the most important hydrographic basin in our country, collecting approximately 17% of the total volume of streams. Due to the increased flood risk caused by the accumulation of rainwater – such as the floods of 1970 and 1975 – numerous hydrotechnical works have been made during the 20th century, resulting in a network of reservoirs, serving for energy production and the diminution of flooding risk (Nanianu et al., 1980). The valley of Siret River is an important birds' migration corridor in the eastern Romania and Europe, located at the eastern edge of the Carpathian Mountains and the Subcarpathian Hills. The area shelters various suitable habitats for birds during the breeding, migration and wintering seasons, and seven Natura 2000 sites have been designated within the hydrographic basin of Siret River, from north to south as follows: ROSPA0110 Reservoirs Rogojești – Bucecea, ROSPA0064 Fălticeni Lakes, ROSPA0125 Vaduri and Pângărați Lakes, ROSPA0072 Middle Siret Meadow, ROSPA0063 Reservoirs Buhuși – Bacău – Berești, ROSPA0071 Inferior Siret Meadow and ROSPA0077 Măxineni Lake.

The main habitats present in the perimeter of the lakes included in the Nature 2000 site ROSPA0063 Reservoirs Buhuși – Bacău – Berești are the open waters, compact reed beds and marshes, small strips of islands of pebble and large islands with clusters of willows and poplars. In the neighbouring areas, there are agricultural fields, while deciduous forests cover the high slope of the eastern shore of the Răcăciuni and Berești reservoirs.

The climate is temperate continental. In the Siret Valley, along the riverbed and on the low terraces, the climate presents a harsher nuance, due to the continental air masses and the proximity to the Tutova Hills (Lupu et al., 1972). The summers are droughty, and the winters are harsh, producing the partial freezing phenomenon on the reservoirs. During the summer, we have observed the aggressive intensity of the water blooming phenomenon.

* Corresponding author: Roșu M.E.

E-mail address: rosu.madalina11@yahoo.com
<https://doi.org/10.29081/scsb.2024.33.2.07>

There are various studies on the diversity and dynamic of the avifauna in the perimeter of the present Nature 2000 site ROSPA0063 Reservoirs Buhuşi – Bacău – Bereşti, out of which we mention the older studies signed by Rang, 1968 or Cătuneanu & Iacob, 1972, but also more recent ones published by Feneru, 2002 or Gache, 2012, 2017, 2018, 2019, 2021 and 2022.

MATERIALS AND METHODS

Our monitoring activity took place during the years 2022 – 2023, in the perimeter of three out of five reservoirs included in the Nature 2000 site: Galbeni, Răcăciuni and Bereşti, located along the valley of Siret River. During our study, we used the transect survey method combined with fixed point observation. The transects followed the west side of each reservoir (Figures 1-3), but in the case of Galbeni reservoir another transect along the terminal segment of the eastern shore near the dam was also necessary.

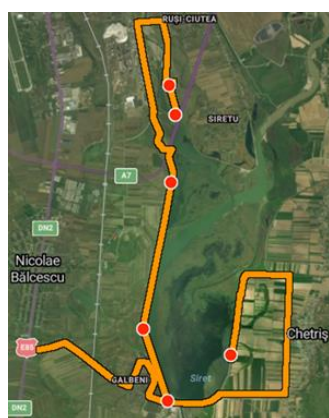


Figure 1. Galbeni reservoir transect with fixed observation points

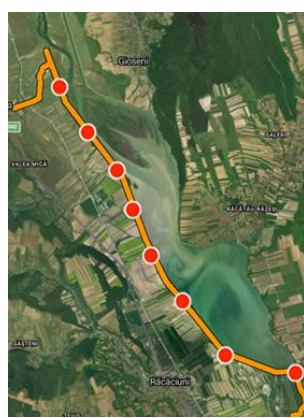


Figure 2. Răcăciuni reservoir transect with fixed observation points



Figure 3. Bereşti reservoir transect with fixed observation points

Usually, our monitoring activity started from the north towards the south limit of the site, by car, following the route Galbeni – Răcăciuni – Bereşti, during the warm months, when the morning fog characteristic for Siret Valley was not present. Sometimes, especially during the winter and in the early spring, we used the south towards the north route, to allow the rising of fog before we reached the area of Bereşti reservoir.

To observe the birds, we used two pairs of binoculars (Nikon Akulon 8 – 24 × 25, Solognac 10 × 50) and a Swarovski 20 – 60x field-spotting scope.

The identification of bird species was done through direct observation, but also by using the songs and callings of males, for the species with a more discreet life. We also used the Merlin application made by Cornell University (USA), Laboratory of Ornithology (<https://merlin.allaboutbirds.org/>). To estimate the number of birds, we counted each bird for the smaller groups and used the strip transect sampling for the flocks larger than 200 individuals.

RESULTS AND DISCUSSION

Following our monitoring data regarding the presence and seasonal dynamic of the bird populations in the perimeter of the Nature 2000 site ROSPA0063 Reservoirs Buhuşi – Bacău – Bereşti, the list of the bird fauna includes 152 species (Table 1), with one accidental species in Romania, the velvet scooter (*Melanitta fusca*), observed only once on Răcăciuni reservoir in the middle January 2023. Comparing our data with previous studies in the area, we mention the missing of 24 bird species related to the aquatic habitats observed during the last decade of 20th century, while we met eight bird species that had not appeared then (Feneru, 2002). We recorded a diversity of bird species in this area that represents 51% of Romania's bird fauna (reported to the 299 bird species with constant presence or regular occurrence in our country - <https://pasaridinromania.sor.ro/specii>), proving its significant ornithological importance in the eastern part of our country.

We recorded the highest diversity (50 species) for the passerines group (Passeriformes) in the studied area, representing 32.89% of the total bird fauna, but we also mention the high diversity of aquatic birds (43 species) and semi-aquatic ones (29 species), that are typical for the largest ecosystem and habitats in the area. Nine passerine species are nesting in the wetland habitats as reed beds (*Panurus biarmicus*, *Locustella luscinioides*, *Acrocephalus arundinaceus*, *Acrocephalus scirpaceus*, *Acrocephalus schoenobaenus*, and *Emberiza schoeniclus*), riparian habitat (*Riparia riparia*), willows (*Remiz pendulinus*) and humid meadows (*Motacilla alba*). Some identified raptor bird species such as *Haliaeetus albicilla*, *Pandion haliaetus* and *Circus aeruginosus* are also dependent on

this habitat as feeding territory or as suitable nesting area. The diversity of bird fauna characteristic for the aquatic ecosystem represents 55.26% of the recorded bird species during our study.

We present, also, quantitative data (Table 1), representing the recorded or estimated number of individuals or pairs for each bird species during one day of monitoring activity, giving the minimum and maximum values for each significant period in the annual biological cycle of birds (breeding season, migration time and wintering period).

Among the passerine species, we have recorded the biggest number of starlings (*Sturnus vulgaris*) – 3728 individuals during the fall migration time, respectively, for the rooks (*Corvus frugilegus*) – 1780 individuals during the wintering period, in the perimeter of Galbeni reservoir. During the migration time, we have recorded the highest species diversity of the bird fauna - 92 species - in the investigated reservoirs' area. We mention the species *Anas platyrhynchos*, *Anas crecca*, *Mareca strepera*, *Fulica atra* and *Chroicocephalus ridibundus* between those with significant populations - hundreds and thousands of individuals – in the perimeter of these three reservoirs.

We confirm the importance of the Siret River Valley as flyway for the migration of white storks (*Ciconia ciconia*); in August 2022, we recorded 1048 individuals crossing the area of Galbeni reservoir and other 3040 in the perimeter of Bereşti reservoir, passing in flocks of hundred birds during an interval of about five hours, lower quantitative data but similar to other recent studies (Gache, 2021). We also remark the diversity and the size of population of raptor bird species crossing this area during the spring and fall migration, especially for the eagles (*Clanga clanga*, *Clanga pomarina*, *Circus gallicus*).

We must mention a series of phenological birds' presence deviations to the norm for our country observed during the migration period in the investigated territory. For example, during the fall of 2022, we met the white storks feeding on the meadows from the lake tail area of Galbeni reservoir and along the western shoreline of Bitriţa River, but also in the perimeter of the waste depot of Bacău city, located nearby, until the middle of October. Usually, this species leaves the region no later than the beginning of the third decade of August. We observed the Eurasian wigeon (*Mareca penelope*) in September 2022, although it is regarded as a winter visitor for Romania. The common shelduck (*Tadorna tadorna*) is a summer visitor in our country with rare occurrence during the winter, especially in the Black Sea Coast Romanian area, but we recorded a significant passage of the species in November 2022, that seems to be characteristic for the autumn migration of this species in the north-eastern part of Romania (Gache, 2002). Also, we remarked the very early presence of a single barn swallow (*Hirundo rustica*) on the 20th March 2023 in the area of the Galbeni reservoir dam. During the same day, we observed an Eurasian hoopoe (*Upupa epops*) performing an intimidation flight to scare away a peregrine falcon (*Falco peregrinus*).

As a rule, the diversity of the bird fauna presented the lowest value during the wintering period, recording only 76 species in the investigated territory as sedentary, partial migratory and winter visitor species. In the perimeter of Galbeni reservoir we met 61 bird species, respectively, 51 bird species on Răcăciuni reservoir and 52 on Bereşti reservoir. We noticed the constant wintering presence during our study, with a rising of population compared to previous studies (Feneru, 2002; Gache, 2012 & 2017), for five species that appears as summer visitors with rare occurrence in the winter in Romania: cormorant (*Phalacrocorax carbo*), pygmy cormorant (*Microcarbo pygmaeus*), great egret (*Ardea alba*), grey heron (*Ardea cinerea*), and the Eurasian marsh harrier (*Circus aeruginosus*). For the last one, we met only female individuals during the wintering time. At the same time, we recorded flocks of tens or hundreds of starlings wandering in the neighbouring areas of the reservoirs: for example, 592 starlings in vicinity of the Galbeni reservoir area in December 2022. A possible explanation for these later presences in the area is the correlation of the migratory behaviour of these species with the current global climate changes, the last winter presenting significantly milder values of temperatures compared to the multi-annual average. An interesting deviation is the presence of one white stork (*Ciconia ciconia*) during the middle wintertime, in January 2023, in the perimeter from the tail of Galbeni reservoir.

In November and December 2022, we recorded thousands of greater white-fronted geese (*Anser albifrons*) feeding on the agricultural fields (canola and wheat) along the western side of the Galbeni and Răcăciuni reservoirs and spending the night on the open waters of these reservoirs. The highest recorded number was of 7700 geese, in November, in the middle sector of Răcăciuni reservoirs. The counted population is significantly higher than that mentioned in the previous studies (Feneru, 2002; Gache, 2012, 2017 & 2021) that notice the using of Prut River basin as migration flyway for this species in the eastern Romania (Gache, 2017 & 2021). We cannot exclude the possibility that the currently ongoing war in Ukraine determined the birds to deviate from their regular migration routes and wintering areas, looking for safety new territories. We mention, also, the first recorded occurrence of the red-breasted goose (*Branta ruficollis*) in the perimeter of this Nature 2000 site, with five birds present inside a flock of greater white-fronted geese, in November 2022 on the Răcăciuni reservoir. Regarding the constant dominant aquatic species in the area, we recorded 6770 mallards (*Anas platyrhynchos*), as the highest number of individuals, in January 2023, on the Bereşti reservoir, while we counted 4774 Eurasian coots (*Fulica atra*), in November 2022, on the Galbeni reservoir.

For the nesting period, we mention that the evaluation of bird's presence and breeding population used only the reservoirs' shorelines monitoring and we had not used the boat access to the large areas inside the reed beds. We confirm the presence of 63 regular nesting species and 6 species as possibly nesting in the area of Galbeni reservoir,

respectively, 62 regular nesting species and 5 possibly nesting species on Răcăciuni reservoir, while we observed 51 regular nesting species and 6 possibly nesting species on Bereşti reservoir.

We mention the occurrence of a pair of greylag goose (*Anser anser*) with goslings in the Galbeni reservoir area and another three pairs in the area of compact reed in the northern area of Bereşti reservoir; this breeding presence indicates a diminished level of the anthropic pressure in the area compared to the previous period (Feneru, 2002; Gache, 2018).

We mention, also, the breeding presence of one pair of ravens (*Corvus corax*) that built their nest on the cornice of the bridge that crosses Bistriţa River, as part of the infrastructure of the A7 highway, in the lake tail area of Galbeni reservoir. The pair of ravens had three chicks which successfully fledged in the 2023's breeding season.

We notice the continued presence of a nesting colony of Eurasian kestrels (*Falco tinnunculus*) on the rocky outcrop in a sector of the high eastern shore of Răcăciuni reservoir, previously identified (Gache, 2018).

We recorded some possible new breeding occurrences in the bird fauna of the investigated area. In the compact reed in the lake tail of Bereşti reservoir, we identified the territorial calls of the Eurasian bittern male (*Botaurus stellaris*) during the spring of 2023. In the same perimeter, we observed an adult Eurasian spoonbill (*Platalea leucorodia*) presenting breeding plumage in May 2023. During our study, we assumed the possibility that a pair of white-tailed eagles (*Haliaeetus albicilla*) might be nesting in one of the neighbourhood forest areas, as we met both adults and immature birds constantly in the area of Galbeni and Răcăciuni reservoirs. In February 2022, on the frozen open waters in front of the Galbeni dam, we recorded one adult and four young white-tailed eagles. During the spring in 2024, we found the nest inside the Gioseni forest perimeter, with the large support of the Forest District in the area and of the Bacău Territorial Service of national Agency for the Natural Protected Areas (ANANP). We cannot exclude, also, the possibility that a pair of black storks (*Ciconia nigra*) might be nesting in one of the neighbourhood woodland perimeters, as we have seen a pair of adults feeding during the breeding season in the perimeter of the Bereşti reservoir.

Regarding the conservation status of bird fauna, in the perimeter of the three reservoirs included in our study, we met 39 bird species mentioned in the Annex 1 of the Birds' Directive, as species that need special management measures, representing criteria for designation of protected sites in the Nature 2000 European network. Five of these species - *Bucephala clangula*, *Calidris pugnax*, *Haematopus ostralegus*, *Streptopelia turtur* & *Netta rufina* – appear also in the Annex 2 of same directive as species to be hunted according to the national laws, as long as the populations don't risk a great decline in individual numbers and survival perspective. Between the identified bird species in the investigated area, we notice that 30 bird species appear in the Red Book of Vertebrates of Romania (Botnariuc & Tatole, 2005), as vulnerable (10 species), endangered (8 species) and critically endangered species (*Pelecanus crispus*, *Haliaeetus albicilla*, *Clanga clanga* and *Milvus migrans*).

Four of these species have a protection status only in our country: three species as vulnerable (*Tadorna tadorna*, *Pandion haliaetus*, *Upupa epops*) and the raven (*Corvus corax*), as endangered, although we noticed an obvious recovery of the last one's population compared to its' status two or three decades ago (Gache, 2002; Feneru, 2002).

We recorded six bird species with protected globally status: *Branta ruficollis*, *Aythya nyroca*, *Microcarbo pygmaeus*, *Pelecanus crispus*, *Haliaeetus albicilla* and *Clanga clanga*, being species with elaborated action plans in order to minimize the risk of extinction and to protect the areas that shelter nesting populations. We observed red breasted goose (*Branta ruficollis*) inside a flock of white-fronted geese, on Răcăciuni reservoir. We met, several times, the ferruginous duck (*Aythya nyroca*) and the pygmy cormorant (*Microcarbo pygmaeus*), while we identified the greater spotted eagle (*Clanga clanga*) in passage through in the area of Bereşti Reservoir on the 22nd April 2023. The Dalmatian pelican (*Pelecanus crispus*) seems to become a constant occurrence in the area, as we have recorded from five to 16 birds (in June 2022 and in May 2023) in the perimeter of Galbeni and Răcăciuni reservoirs. We assume that they are immature birds that wander along the river course looking for food, searching sites where they won't have to compete with reproductive adults for the resources' access.

Analysing the trends for the bird species protected through Annex 1 of Birds Directive in the studied area, 21 species have rising populations, 8 present constant populations, while 10 species have declining populations comparative with the previous existing quantitative data (Feneru, 2002; Gache, 2012, 2017, 2018 & 2021).

Some of the threats for the bird species living in the area of the investigated reservoirs include the constant and aggressive presence (in great numbers and sometimes with boats) of sportive fishermen, including during the winter when the weather is very harsh. Galbeni reservoir is under the highest pressure due to its location in a close vicinity to Bacău City: during our study activity in the field, we recorded a total number of 155 fishermen in the area of this reservoir. The constant and intense fishing activity might explain the relatively small number of breeding pairs, despite the fact that the suitable area covers large surfaces and various categories of breeding habitats.

We notice, also, the constant and significant presence of sheep and goats, grazing in the neighbouring areas, including the edges of the lakes if there it was enough suitable vegetation for them. We mention an illegally built sheepfold in the perimeter of Nature 2000 site ROSPA0063 Reservoirs Buhuşi – Bacău – Bereşti, on the western side of Bereşti reservoir; its owner refused to leave the area, even though he had been fined numerous times, accepting only to move the improvised building slightly closer to the compact reed's edge.

We found the tracks of several fires that were set on the tail area of Galbeni reservoir, where Bistriţa River met Siret River and flow into the reservoir. We also observed this phenomenon on a small canal on the west side of Răcăciuni reservoir. We also identified illegal exploitation of the willow trees in the perimeter of the last reservoir.

Table 1. The diversity of bird fauna on the Galbeni, Răcăciuni and Bereşti, 2022- 2023

No.	Species	Galbeni			Răcăciuni			Bereşti			Trends	Birds' Directive	Romanian Red Book of Vertebrates
		Breeding (p)	Migration (i)	Wintering (i)	Breeding (p)	Migration (i)	Wintering (i)	Breeding (p)	Migration (i)	Wintering (i)			
1.	<i>Phasianus colchicus</i>	2 – 3	1 – 11	0 – 13	1 – 2	–	0 – 1	1 – 2	0 – 1	1 – 4	0	A2	–
2.	<i>Perdix perdix</i>	–	–	0 – 2	–	–	–	–	–	–	–1	A2	–
3.	<i>Coturnix coturnix</i>	–	–	–	–	–	–	0 – 1*	–	–	–1	A2	–
4.	<i>Cygnus olor</i>	2 – 4	6 – 117	199 – 337	1 – 2	18 – 106	35 – 166	2 – 5	20 – 132	139 – 328	+1	A2	–
5.	<i>Cygnus cygnus</i>	–	–	0 – 5	–	–	71 – 192	–	–	7 – 13	+1	A1	–
6.	<i>Branta ruficollis</i>	–	–	–	–	–	0 – 5	–	–	–	+1	A1	E
7.	<i>Anser anser</i>	1 – 2	2 – 15	0 – 20	–	–	9 – 12	2 – 5	2 – 6	1 – 2	–1	A2	–
8.	<i>Anser albifrons</i>	–	–	72 – 1560	–	–	27 – 7700	–	–	4 – 1450	+1	A2	–
9.	<i>Anser fabalis</i>	–	–	–	–	–	–	–	–	0 – 1	+1	A2	–
10.	<i>Anas platyrhynchos</i>	6 – 11	66 – 905	461 – 3241	2 – 6	98 – 1176	475 – 933	2 – 4	8 – 1162	2037 – 6770	+1	A2	–
11.	<i>Anas acuta</i>	–	–	–	–	–	0 – 1	–	–	–	–1	A2	–
12.	<i>Anas crecca</i>	–	4 – 131	51 – 303	0 – 3*	12 – 108	14 – 510	–	7 – 122	26 – 93	–1	A2	–
13.	<i>Mareca strepera</i>	3 – 5	12 – 146	50 – 440	1 – 2	4 – 388	0 – 82	1 – 2	2 – 92	21 – 118	–1	A2	–
14.	<i>Mareca penelope</i>	–	4 – 52	12 – 398	–	0 – 18	0 – 14	–	2 – 70	8 – 54	–1	A2	–
15.	<i>Spathula clypeata</i>	–	0 – 4	–	3 – 6*	2 – 34	–	–	4 – 5	0 – 4	+	A2	–
16.	<i>Spathula querquedula</i>	0 – 3*	0 – 20	–	0 – 1*	6 – 25	–	0 – 1	24 – 46	0 – 4	–1	A2	–
17.	<i>Tadorna tadorna</i>	–	–	–	–	–	0 – 2	–	–	0 – 1	+1	–	V
18.	<i>Netta rufina</i>	–	–	–	–	–	–	–	0 – 2	–	+1	A2	E
19.	<i>Aythya fuligula</i>	–	0 – 6	51 – 128	–	1 – 277	138 – 478	–	0 – 85	–	+1	A2	–
20.	<i>Aythya nyroca</i>	–	–	–	–	–	–	–	0 – 2	–	–1	A1	V
21.	<i>Aythya ferina</i>	–	9 – 18	12 – 235	–	94 – 439	27 – 347	–	30 – 132	43 – 65	+1	A2	–
22.	<i>Melanitta fusca</i>	–	–	–	–	–	0 – 7	–	–	–	+1	A2	–
23.	<i>Clangula hyemalis</i>	–	–	–	–	–	0 – 1	–	–	–	+1	A2	–
24.	<i>Bucephala clangula</i>	–	–	4 – 58	–	0 – 48	68 – 299	–	2 – 36	0 – 203	+1	A2	V
25.	<i>Mergus merganser</i>	–	–	–	–	–	–	–	–	0 – 6	+1	A2	–
26.	<i>Mergellus albellus</i>	–	–	21 – 49	–	–	1 – 17	–	0 – 36	25 – 137	+1	A1	V
27.	<i>Gavia arctica</i>	–	–	–	–	–	–	–	0 – 1	1 – 2	+1	A1	–
28.	<i>Phalacrocorax carbo</i>	2 – 3?	10 – 45	36 – 247	0 – 2*	16 – 44	5 – 42	0 – 29*	13 – 178	21 – 59	+1	–	–
29.	<i>Microcarbo pygmaeus</i>	–	1 – 57	3 – 6	–	–	–	–	–	0 – 2	+1	A1	V
30.	<i>Pelecanus crispus</i>	–	–	–	6 – 15*	0 – 5	–	–	–	–	+1	A1	CE
31.	<i>Botaurus stellaris</i>	–	0 – 1	–	–	–	–	1 – 2?	0 – 3	–	0	A1	–
32.	<i>Ixobrychus minutus</i>	3 – 5	–	–	1 – 2	–	–	2 – 3	–	–	–1	A1	–
33.	<i>Nycticorax nycticorax</i>	2 – 4	–	–	–	–	–	2 – 3	–	–	–1	A1	V
34.	<i>Egretta garzetta</i>	3 – 5	1 – 22	–	3 – 4	1 – 19	–	5 – 6	1 – 26	–	–1	A1	E
35.	<i>Ardea alba</i>	2 – 4	6 – 28	9 – 28	2 – 3	1 – 27	1 – 15	3 – 4	4 – 30	1 – 7	+1	A1	E
36.	<i>Ardea cinerea</i>	3 – 5	1 – 11	1 – 12	4 – 5	1 – 16	1 – 10	4 – 5	3 – 15	0 – 2	0	–	–

No.	Species	Galbeni			Răcăciuni			Bereşti			Trends	Birds' Directive	Romanian Red Book of Vertebrates
		Breeding (p)	Migration (i)	Wintering (i)	Breeding (p)	Migration (i)	Wintering (i)	Breeding (p)	Migration (i)	Wintering (i)			
37.	<i>Ardea purpurea</i>	1 – 2	1 – 5	–	1 – 2	2 – 3	–	1 – 3	2 – 12	–	0	A1	E
38.	<i>Platalea leucorodia</i>	–	–	–	–	–	–	0 – 1?	–	–	–1	A1	E
39.	<i>Ciconia nigra</i>	–	–	–	–	–	–	0 – 2*	–	–	+1	A1	V
40.	<i>Ciconia ciconia</i>	187 – 231*	33 – 1048	0 – 1	–	–	–	0 – 5*	1 – 3040	–	+1	A1	V
41.	<i>Haliaeetus albicilla</i>	0 – 1*	–	0 – 5	–	0 – 2	–	–	–	–	+1	A1	CE
42.	<i>Clanga clanga</i>	–	–	–	–	–	–	–	0 – 1	–	+1	A1	CE
43.	<i>Clanga pomarina</i>	0 – 2*	0 – 3	–	–	0 – 1	–	–	0 – 1	–	+1	A1	V
44.	<i>Circaetus gallicus</i>	–	–	–	–	0 – 1	–	–	–	–	+1	A1	V
45.	<i>Buteo buteo</i>	–	1 – 2	1 – 7	0 – 1	1 – 5	1 – 5	0 – 2*	1 – 2	1 – 2	0	–	–
46.	<i>Buteo lagopus</i>	–	–	0 – 1?	–	–	0 – 1	–	0 – 1	–	+1	–	–
47.	<i>Pernis apivorus</i>	–	0 – 1	–	–	–	–	–	0 – 1	–	+1	A1	V
48.	<i>Accipiter gentilis</i>	–	–	0 – 1	0 – 1	1 – 2	0 – 2	–	0 – 2	1 – 2	+1	–	–
49.	<i>Accipiter nisus</i>	–	1 – 3	0 – 1	0 – 1	1 – 3	–	–	0 – 3	0 – 1	+1	–	–
50.	<i>Milvus migrans</i>	–	0 – 2	–	–	0 – 1	–	–	–	–	+1	A1	CE
51.	<i>Circus aeruginosus</i>	2 – 3	1 – 4	1 – 2	–	1 – 2	–	1 – 2	2 – 4	0 – 1	0	A1	–
52.	<i>Circus pygargus</i>	–	–	–	–	1 – 2	–	–	0 – 1	–	0	A1	E
53.	<i>Circus cyaneus</i>	–	–	0 – 1	–	–	1 – 2	–	0 – 1	2 – 3	+1	A1	–
54.	<i>Pandion haliaetus</i>	–	0 – 1	–	–	–	–	–	1 – 2	–	+1	–	V
55.	<i>Falco peregrinus</i>	–	0 – 1	–	–	–	–	–	–	–	+1	A1	E
56.	<i>Falco columbarius</i>	–	–	0 – 1	–	–	–	–	–	0 – 1	+1	A1	–
57.	<i>Falco subbuteo</i>	–	–	–	0 – 1	–	–	–	–	0 – 1	–1	–	–
58.	<i>Falco tinnunculus</i>	0 – 1	1 – 3	1 – 4	6 – 10	1 – 2	–	–	1 – 4	0 – 1	–1	–	–
59.	<i>Rallus aquaticus</i>	1 – 2?	–	–	0 – 1?	–	–	1 – 2?	–	–	+1	–	–
60.	<i>Porzana parva</i>	0 – 1?	0 – 2	–	–	–	–	–	–	–	+1	A1	–
61.	<i>Gallinula chloropus</i>	5 – 6	1 – 16	0 – 1	2 – 3	0 – 5	–	1 – 3	2 – 3	0 – 1	–1	A2	–
62.	<i>Fulica atra</i>	8 – 10	18 – 1326	646 – 4774	–	0 – 3	0 – 3	4 – 5	6 – 712	517 – 1647	+1	A2	–
63.	<i>Gallinago gallinago</i>	–	0 – 1	–	–	–	–	–	0 – 4	–	+1	A2	–
64.	<i>Calidris pugnax</i>	–	–	–	0 – 62*	0 – 54	–	0 – 7*	1 – 11	–	+1	A1, A2	–
65.	<i>Calidris ferruginea</i>	–	–	–	–	–	–	–	0 – 16	–	+1	–	–
66.	<i>Calidris temminckii</i>	–	0 – 3	–	–	–	–	–	–	–	+1	–	–
67.	<i>Calidris falcinellus</i>	–	–	–	–	–	–	–	0 – 2	–	+1	–	–
68.	<i>Numenius arquata</i>	–	0 – 15	0 – 1	–	0 – 1	–	–	–	–	+1	A2	–
69.	<i>Limosa limosa</i>	–	–	–	–	0 – 27	–	–	–	–	+1	A2	–
70.	<i>Actitis hypoleucos</i>	–	2 – 5	–	0 – 6*	0 – 3	–	0 – 2*	–	–	+1	–	–
71.	<i>Tringa ochropus</i>	–	1 – 5	–	–	2 – 18	–	–	–	–	+1	–	–
72.	<i>Tringa glareola</i>	–	4 – 17	–	–	0 – 23	–	0 – 2*	3 – 22	–	+1	A1	–
73.	<i>Tringa nebularia</i>	–	0 – 1	–	–	5 – 8	–	0 – 29*	2 – 11	–	+1	A2	–

No.	Species	Galbeni			Răcăciuni			Bereşti			Trends	Birds' Directive	Romanian Red Book of Vertebrates
		Breeding (p)	Migration (i)	Wintering (i)	Breeding (p)	Migration (i)	Wintering (i)	Breeding (p)	Migration (i)	Wintering (i)			
74.	<i>Tringa stagnatilis</i>	–	0 – 2	–	–	0 – 7	–	–	3 – 7	–	+1	–	–
75.	<i>Tringa totanus</i>	–	–	–	–	0 – 2	–	0 – 7*	1 – 4	–	+1	A2	–
76.	<i>Tringa erythropus</i>	–	–	–	0 – 21*	–	–	0 – 1*	–	–	+1	A2	–
77.	<i>Vanellus vanellus</i>	0 – 12*	4 – 35	–	4 – 5	3 – 62	–	6 – 8	21 – 49	–	–1	A2	–
78.	<i>Charadrius dubius</i>	–	0 – 5	–	1 – 2	–	–	–	0 – 10	–	0	–	–
79.	<i>Haematopus ostralegus</i>	–	–	–	0 – 1?	–	–	0 – 2*	0 – 2	–	+1	A2	V
80.	<i>Recurvirostra avosetta</i>	–	–	–	0 – 1?	0 – 3	–	–	–	–	0	A1	V
81.	<i>Himantopus himantopus</i>	–	–	–	–	–	–	1 – 3?	–	–	0	A1	E
82.	<i>Larus fuscus</i>	–	0 – 12	–	–	–	0 – 1	–	–	–	+1	A2	–
83.	<i>Larus cachinnans</i>	5 – 6	132 – 876	330 – 2479	2 – 4	5 – 45	17 – 521	2 – 4	12 – 83	27 – 181	+1	A2	–
84.	<i>Larus canus</i>	–	0 – 14	–	–	–	–	–	–	0 – 53	+1	A2	–
85.	<i>Chroicocephalus ridibundus</i>	8 – 10	9 – 2555	77 – 637	14 – 18	18 – 161	2 – 425	2 – 3	5 – 146	5 – 57	+1	A2	–
86.	<i>Chlidonias niger</i>	0 – 4*	–	–	–	–	–	–	–	–	–1	A1	–
87.	<i>Chlidonias hybrida</i>	5 – 6	21 – 25	–	2 – 3	17 – 18	–	–	0 – 18	–	–1	A1	–
88.	<i>Chlidonias leucopterus</i>	0 – 64*	–	–	–	–	–	–	–	–	–1	–	–
89.	<i>Sterna hirundo</i>	4 – 6	8 – 26	–	5 – 7	6 – 29	–	5 – 6	23 – 28	–	0	A1	–
90.	<i>Podiceps cristatus</i>	2 – 4	2 – 12	1 – 4	–	0 – 1	–	2 – 3	1 – 19	1 – 2	–1	–	–
91.	<i>Tachybaptus ruficollis</i>	0 – 1	2 – 29	20 – 71	–	1 – 9	15 – 31	–	2 – 3	–	+1	–	–
92.	<i>Podiceps nigricollis</i>	–	0 – 2	–	–	–	–	–	–	–	–1	–	–
93.	<i>Columba oenas</i>	–	5 – 14	0 – 18	1 – 2	1 – 38	0 – 5	2 – 4	0 – 81	–	+1	A2	–
94.	<i>Columba palumbus</i>	3 – 4	1 – 21	18 – 47	2 – 3	8 – 53	7 – 52	7 – 8	1 – 22	–	+1	A2	–
95.	<i>Streptopelia turtur</i>	2 – 3	0 – 21	–	5 – 7	5 – 39	–	0 – 1	2 – 9	–	+1	A2	V
96.	<i>Streptopelia decaocto</i>	–	2 – 6	x	0 – 1*	0 – 1	x	0 – 3*	0 – 1	x	–1	A2	–
97.	<i>Cuculus canorus</i>	6 – 8	0 – 2	–	10 – 12	0 – 1	–	8 – 10	0 – 1	–	–1	–	–
98.	<i>Athene noctua</i>	–	–	0 – 1	–	–	–	–	–	–	+1	–	–
99.	<i>Alcedo atthis</i>	0 – 1?	0 – 1	0 – 1	–	0 – 1	–	–	–	–	0	A1	–
100.	<i>Merops apiaster</i>	–	0 – 12	–	0 – 2*	28 – 99	–	0 – 2*	12 – 81	–	+1	–	–
101.	<i>Upupa epops</i>	1 – 2	1 – 2	–	–	0 – 6	–	–	0 – 3	–	0	–	V
102.	<i>Dendrocopos major</i>	1 – 2	–	–	2 – 4	–	0 – 2	0 – 1	0 – 1	–	–1	–	–
103.	<i>Lanius collurio</i>	2 – 3	1 – 4	–	2 – 3	1 – 8	–	1 – 2	1 – 5	–	–1	A1	–
104.	<i>Lanius minor</i>	–	0 – 2	–	1 – 2	0 – 1	–	–	0 – 2	–	–1	A1	–
105.	<i>Lanius excubitor</i>	–	1 – 3	1 – 2	–	1 – 2	0 – 1	–	0 – 4	0 – 1	+1	–	–
106.	<i>Garrulus glandarius</i>	0 – 1	0 – 1	–	–	0 – 1	0 – 1	–	–	–	–1	A2	–
107.	<i>Pica pica</i>	2 – 3	1 – 31	5 – 32	1 – 2	3 – 38	4 – 40	1 – 2	2 – 11	7 – 64	+1	A2	–
108.	<i>Coloeus monedula</i>	4 – 5	16 – 40	12 – 24	–	–	–	–	–	–	–1	A2	–

No.	Species	Galbeni			Răcăciuni			Bereşti			Trends	Birds' Directive	Romanian Red Book of Vertebrates
		Breeding (p)	Migration (i)	Wintering (i)	Breeding (p)	Migration (i)	Wintering (i)	Breeding (p)	Migration (i)	Wintering (i)			
109.	<i>Corvus frugilegus</i>	169 – 428*	130 – 516	262 – 1780	0 – 99*	8 – 52	–	0 – 153*	2 – 132	–	+1	A2	–
110.	<i>Corvus cornix</i>	0 – 2*	–	x	0 – 2*	–	x	–	4 – 37	x	+1	–	–
111.	<i>Corvus corax</i>	0 – 1	3 – 11	8 – 12	0 – 3*	1 – 6	1 – 21	0 – 2*	1 – 7	2 – 9	+1	–	E
112.	<i>Poecile palustris</i>	2 – 3	–	–	1 – 2	–	–	4 – 5	0 – 5	–	+1	–	–
113.	<i>Cyanistes caeruleus</i>	1 – 2	–	0 – 2	1 – 2	–	0 – 2	2 – 3	6 – 9	–	0	–	–
114.	<i>Parus major</i>	4 – 5	0 – 2	1 – 2	4 – 5	–	2 – 4	4 – 6	0 – 5	0 – 3	–1	–	–
115.	<i>Remiz pendulinus</i>	2 – 3	0 – 10	0 – 4	3 – 5	0 – 2	–	1 – 2	0 – 5	–	0	–	–
116.	<i>Panurus biarmicus</i>	15 – 16	13 – 18	0 – 90	13 – 15	5 – 12	16 – 26	8 – 10	11 – 42	0 – 15	+1	–	–
117.	<i>Galerida cristata</i>	5 – 7	2 – 16	0 – 4	4 – 6	2 – 6	3 – 24	2 – 3	1 – 25	1 – 11	+1	–	–
118.	<i>Alauda arvensis</i>	3 – 5	0 – 16	–	4 – 8	0 – 10	–	4 – 5	0 – 11	–	–1	A2	–
119.	<i>Riparia riparia</i>	0 – 38*	0 – 11	–	80 – 120	0 – 437	–	20 – 35	32 – 38	–	–1	–	–
120.	<i>Hirundo rustica</i>	25 – 63*	1 – 675	–	25 – 129*	12 – 354	–	8 – 94*	5 – 226	–	+1	–	–
121.	<i>Delichon urbicum</i>	x	–	–	0 – 4*	–	–	–	–	–	–1	–	–
122.	<i>Phylloscopus collybita</i>	3 – 5	–	–	2 – 3	0 – 5	–	3 – 5	–	–	–1	–	–
123.	<i>Locustella luscinioides</i>	4 – 5	x	–	6 – 7	x	–	5 – 6	x	–	–1	–	–
124.	<i>Acrocephalus schoenobaenus</i>	17 – 18	x	–	16 – 18	x	–	15 – 16	x	–	–1	–	–
125.	<i>Acrocephalus scirpaceus</i>	14 – 16	x	–	25 – 28	x	–	12 – 14	x	–	–1	–	–
126.	<i>Acrocephalus arundinaceus</i>	30 – 32	x	–	32 – 35	x	–	24 – 25	x	–	0	–	–
127.	<i>Sylvia atricapilla</i>	1 – 2	x	–	1 – 2	x	–	1 – 3	x	–	–1	–	–
128.	<i>Sylvia borin</i>	3 – 4	x	–	4 – 5	x	–	3 – 4	x	–	–1	–	–
129.	<i>Curruca communis</i>	1 – 2	x	–	2 – 3	x	–	1 – 2	x	–	+1	–	–
130.	<i>Curruca curruca</i>	1 – 2	x	–	1 – 2	x	–	0 – 1	x	–	+1	–	–
131.	<i>Luscinia luscinia</i>	2 – 3	x	–	1 – 2	–	–	0 – 1	–	–	–1	–	–
132.	<i>Saxicola rubetra</i>	0 – 2	3 – 20	–	0 – 1?	–	–	0 – 1?	–	–	–1	–	–
133.	<i>Saxicola rubicola</i>	0 – 1?	1 – 3	–	–	0 – 1	–	–	–	–	+1	–	–
134.	<i>Phoenicurus ochruros</i>	0 – 1?	x	–	0 – 2	x	–	–	0 – 3	0 – 3	–1	–	–
135.	<i>Oenanthe oenanthe</i>	0 – 1	1 – 12	–	0 – 1	1 – 2	–	0 – 1	4 – 12	–	0	–	–
136.	<i>Turdus merula</i>	1 – 2	–	–	0 – 1	0 – 4	0 – 5	1 – 2	0 – 1	0 – 4	–1	A2	–
137.	<i>Turdus pilaris</i>	–	–	0 – 18	–	0 – 3	1 – 18	–	0 – 87	–	+1	A2	–
138.	<i>Turdus viscivorus</i>	–	0 – 754	–	–	–	–	–	0 – 3	–	+1	A2	–
139.	<i>Sturnus vulgaris</i>	16 – 18	12 – 3728	0 – 592	20 – 22	7 – 932	0 – 120	18 – 20	194 – 1850	81 – 142	+1	A2	–
140.	<i>Passer domesticus</i>	5 – 6	14 – 26	15 – 42	4 – 5	7 – 33	21 – 93	x	52 – 87	0 – 72	–1	–	–
141.	<i>Passer montanus</i>	2 – 3	3 – 20	6 – 20	4 – 5	11 – 12	12 – 38	x	22 – 342	0 – 21	+1	–	–
142.	<i>Anthus campestris</i>	1 – 2	0 – 3	–	1 – 2	–	–	0 – 1	0 – 7	–	–1	A1	–

No.	Species	Galbeni			Răcăciuni			Bereşti			Trends	Birds' Directive	Romanian Red Book of Vertebrates
		Breeding (p)	Migration (i)	Wintering (i)	Breeding (p)	Migration (i)	Wintering (i)	Breeding (p)	Migration (i)	Wintering (i)			
143.	<i>Motacilla flava</i>	2 – 3	4 – 22	–	4 – 5	6 – 9	–	4 – 5	3 – 13	–	0	–	–
144.	<i>Motacilla alba</i>	1 – 2	1 – 42	–	2 – 3	4 – 18	–	1 – 2	12 – 53	–	+1	–	–
145.	<i>Fringilla coelebs</i>	5 – 6	–	0 – 11	10 – 12	–	–	4 – 5	–	–	–1	–	–
146.	<i>Chloris chloris</i>	4 – 5	0 – 3	1 – 8	3 – 5	2 – 19	–	x	21 – 33	–	+1	–	–
147.	<i>Spinus spinus</i>	–	–	0 – 9	–	–	–	–	–	0 – 17	+1	–	–
148.	<i>Carduelis carduelis</i>	8 – 10	7 – 45	5 – 46	5 – 6	23 – 139	2 – 11	x	11 – 38	5 – 28	+1	–	–
149.	<i>Linaria cannabina</i>	3 – 4	–	0 – 7	4 – 5	–	–	x	4 – 17	0 – 23	+1	–	–
150.	<i>Emberiza calandra</i>	5 – 6	2 – 7	0 – 3	5 – 8	3 – 7	0 – 7	2 – 3	5 – 31	–	0	–	–
151.	<i>Emberiza citrinella</i>	2 – 3	x	15 – 25	4 – 6	x	0 – 3	1 – 2	x	–	0	–	–
152.	<i>Emberiza schoeniclus</i>	14 – 18	2 – 30	8 – 46	10 – 12	0 – 19	4 – 45	8 – 12	7 – 31	8 – 28	+1	–	–

Legend: (p) – pairs, (i) - individuals

Breeding: * - non-breeding individuals, x – uncounted presence of species:

Trends: 0 - constant population, +1 - increasing population, -1 - decreasing population.

Birds' Directive: A1 – bird species mentioned in the Annex 1, A2 – bird species mentioned in the Annex 2.

Romanian Red Book of Vertebrates: CE – critically endangered species, E – endangered species, V – vulnerable species.

CONCLUSION

Our study's main aim is to complete the existing data regarding the diversity of the bird fauna in the perimeter of Galbeni, Răcăciuni and Bereşti reservoirs, as part of the Nature 2000 site ROSPA0063 Reservoirs Buhuşi – Bacău – Bereşti.

During our ornithological monitoring activity in the area, we recorded 152 bird species.

For the migration time, we mention the passage of white storks (*Ciconia ciconia*) and raptors. We noticed the unusual presence of flocks reuniting thousands of greater white-fronted geese (*Anser albifrons*), significantly larger than the previous data for this area.

During the winter, the lakes freeze to some degree, determining the large groups of birds to gather together on the unfrozen areas. We observed wintering flocks of hundreds of starlings (*Sturnus vulgaris*) and tens of common wood pigeons (*Columba palumbus*). We mention the constant wintering presence of birds considered summer visitors in Romania (*Phalacrocorax carbo*, *Microcarbo pygmaeus*, *Ardea alba*, *Ardea cinerea*).

We recorded 63 regular breeding bird species and 6 possible breeding species on the territory of Galbeni reservoir, 62 regular breeding species and 5 possible breeding species in the area of Răcăciuni reservoir, respectively, 51 regular breeding species and 6 possible breeding species in the perimeter of Bereşti reservoir. The breeding population is not significant comparing with similar areas in the Prut River basin, for example (Gache, 2002), but the diversity of breeding bird species is higher than the existing data in previous studies in the area.

We met 39 bird species mentioned in the Annex 1 of Birds' Directive, respectively, 30 species are included in the Red Book of Vertebrates from Romania. We observed some of these species only during migration time (*Clanga clanga*, *Clanga pomarina*, *Circaetus gallicus*, *Pandion haliaetus*) and others use this area as feeding territory (*Pelecanus crispus*). Twenty-one species of birds appearing in the Annex 1 of Birds' Directive show a positive trend of their population in the area, while 8 present constant populations and other 10 present a negative trend.

The anthropic pressure on the bird fauna is significant in the investigated area. The main risk factors are the constant high numbers of sportive fishermen, the deliberate burning of vegetation by the local community, which could lead to the burning of the reed, the excessive extraction of willow trees, and the building of illegal sheepfolds in the Natura 2000 site.

ACKNOWLEDGEMENTS

We are grateful for the logistic support and participation of the Bacău Territorial Service of National Agency for the Natural Protected Areas (ANANP).

REFERENCES

1. Botnariuc N., Tatole V. (Eds.) *Cartea Roşie a Vertebratelor din România*. Academia Română & Muzeul Naţional de Istorie Naturală "Grigore Antipa", Bucureşti, 2015.
2. Cătuneanu I., Iacob V. *Contribuţii la studierea deplasărilor locale şi sezoniere efectuate de păsări, prin metoda inelărilor, în judeţul Bacău*. Muzeul de Ştiinţe Naturii Bacău, Studii şi Comunicări, 1972, 307-320.
3. Feneru F. *Studiul avifaunei acvatice din bazinul mijlociu al Siretului. Teză de doctorat*. Universitatea „Alexandru Ioan Cuza”, Iaşi, 2002.
4. Gache C. *Actual status of rare and protected bird species in the basin of Siret River (Romania)*. Proceedings of the 8th International Congress of the Ecologist of the Republic of Montenegro, Budva, 2019, 31-40.
5. Gache C. *Aspects on the breeding season of bird fauna in the ROSPA0063 Reservoirs Bacău – Galbeni – Răcăciuni (Romania), Oltenia*. Muzeul Olteniei, Craiova, Studii şi comunicări. Ştiinţele Naturii, 2018, 34 (1): 149-157.
6. Gache C. *Aspects on the diversity of bird fauna during the migration time in the ROSPA0063 Reservoirs Buhuşi – Bacău – Bereşti (Romania), Oltenia*. Muzeul Olteniei, Craiova, Studii şi Comunicări. Ştiinţele Naturii, 2021, 37 (2): 120-129.
7. Gache C. *Assessment on the present status of bird fauna from the reservoirs Bacău – Galbeni – Răcăciuni (ROSPA0063), Oltenia*. Muzeul Olteniei, Craiova, Studii şi Comunicări. Ştiinţele Naturii, 2012, 28 (1): 129-136.
8. Gache C. *Dinamica avifaunei din bazinul Prutului*. Publicaţiile S.O.R., 15, Editura Risoprint, Cluj Napoca, 2002.
9. Gache C. *Monitoring of waterfowls during the wintering time in ROSPA0063, Buhuşi – Bacău – Bereşti dam lakes (Romania)*. Proceedings of the 7th International Congress of Ecologist of the Republic of Montenegro, 2017, Sutomore: 168-175.
10. Gache C. *The current status of the diversity of bird fauna on the Gârleni reservoir (Romania) as potential part of Natura 2000 network, Oltenia*. Muzeul Olteniei, Craiova, Studii şi Comunicări. Ştiinţele Naturii, 2022, 38 (2): 119-129.
11. Lupu N.N., Văcăraşu I., Brânduş C., Tufescu V., Badea L., Gâstescu P., Velcea I. *Judeţul Bacău, Colecţia Judeţele patriei*, Editura Academiei Republicii Socialiste România, Bucureşti, 1972.
12. Năianu S., Barabaş N., Mîtreă I., Zaharia D., Bucur G., Florea V., Rusu P. *Bacău. Monografie, Colecţia Judeţele patriei*, Editura Sport – Turism, Bucureşti, 1980.
13. Rang Cătălin P. *Studiul dinamicii unor comunităţi de păsări din bazinul mijlociu al râului Siret incluzând zonele lacurilor de acumulare*. Publicaţiile Societăţii ornitologice române, Cluj-Napoca, 2002.
14. *** *Enciclopedia geografică a României*. Editura ştiinţifică şi Enciclopedică, Bucureşti, 1982.

15. *** *Anuarul Statistic al judeţului Bacău*, D.S.J. Bacău, 2023.
 16. *** *Catalogul habitatelor, speciilor şi siturilor Natura 2000 în România*. Ministerul Mediului şi Schimbărilor Climatice & SC Natura Management SRL, Bucureşti, 2013.
 17. *** *Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds*. Official Journal of the European Union, 26.01.2010, L20/7 – L20/25, Brussels.
 18. *** *H.G. 1284/2007 privind declararea ariilor de protecţie specială avifaunistică ca parte integrată a reţelei Natura 2000 în România*. Monitorul Oficial, Bucureşti, partea I, 739/31.10.2007
 19. *** *H.G. 2151/2004 privind instituirea regimului de arie protejată pentru noi zone*. Monitorul Oficial, Bucureşti, 12.01.2005.
 20. *** *H.G. 971/2011 pentru modificarea şi completarea H.G. 1284/2007 privind declararea ariilor de protecţie specială avifaunistică ca parte integrantă a reţelei ecologice europene Natura 2000 în România*. Monitorul Oficial, Bucureşti, partea I, 715/11.10/2011
 21. *** *O.U. 57 / 20.07.2007 privind regimul ariilor naturale protejate, conservarea habitatelor naturale, a florei şi faunei sălbatice*. Monitorul Oficial, Bucureşti, 442/29.07.2007.
 22. *** *Planul de management al sitului Lacurile de acumulare Buhuşi – Bacău – Bereşti ROSPA0063*, 2012.
 23. *** *Planul pentru Prevederea, Protecţia şi Diminuarea Efectelor Inundaţiilor (PPPDEI) în bazinul hidrografic Siret*, Bacău, 2014.
- Web resources:
24. <https://www.bing.com/maps?osid=1323bd2a-3402-448b-a8b5-38645f1b0535&cp=46.472562~26.938562&lvl=12.08&style=a&pi=0&v=2&sV=2&form=S00027>
 25. <https://www.bing.com/maps?osid=a488a341-2d9e-4872-beef-9f661a48fe52&cp=46.367661~26.993291&lvl=13.08&style=a&pi=0&v=2&sV=2&form=S00027>
 26. <https://www.bing.com/maps?osid=4a284f02-1f76-4ad4-b032-5f488212b74f&cp=46.233808~27.094467&lvl=12.08&style=a&pi=0&v=2&sV=2&form=S00027>
 27. <https://merlin.allaboutbirds.org/>

