

NEW OBSERVATIONS REGARDING THE AQUATIC AVIFAUNA FROM ROSPA0010BISTREȚ (SW ROMANIA)

RIDICHE Mirela-Sabina

Abstract. In the present study, we render certain new aspects of the structure of the communities of aquatic birds belonging to the Pelecaniformes and Charadriiformes Orders, located within ROSPA0010Bistreț in the Danube Floodplain (South-West of Romania), during the vernal and summery seasons (May-July), in the years 2013 and 2020. We notice that the biotopes in the area of Bistreț Lake are in continuous transformation, especially as a result of the abandonment of the fishing activities that took place here until 2006. This fact positively influences the composition and density of the aquatic avifauna. An important factor that triggered the changes in the spectrum of the aquatic avifauna of SPA Bistreț is the climatic one. In recent years, as a consequence of the lower amounts of precipitations, we remarked a significant increase in the number of pelicans (e.g. *P. onocrotalus* with a maximum number of 500 of individuals, adults and immatures), whose feeding requirements are met by shallow or medium water level basins. The current ecological conditions have created trophic opportunities and have favoured the establishment of several colonial or solitary nesting species of the Order Pelecaniformes (*Botaurus stellaris*, *Ixobrychus minutus*, *Nycticorax nycticorax*, *Ardeola ralloides*, *Egretta garzetta*, *Ardea purpurea*, *Platalea leucorodia*, *Plegadis falcinellus*). The periodical fluctuations of the water level especially influences the dynamics of the species and populations belonging to the Order Charadriiformes. We mention several species belonging to the aforementioned order that have nested here for several successive years (*Himantopus himantopus*, *Vanellus vanellus*, *Limosa limosa*, *Chroicocephalus ridibundus*, *Chlidonias hybrida*) or after a long absence during the breeding season: *Glareola pratincola*, *Sternula albifrons*. Although they are species of faunal and conservative interest, also included in the EC Birds Directive, *Glareola pratincola* and *Sternula albifrons* are not included in the standard data form of Bistreț site, due to their absence during the period of documentation and registration of the lake in the Natura 2000 network, probable; it is necessary a special monitoring and protection of the colonies if they maintain within the protected area. Moreover, in the near future, the revision of the standard data form of the site have to be considered so that the new bird community may benefit from concrete conservation measures.

Keywords: aquatic birds, Pelecaniformes Order, Charadriiformes Order, ROSPA0010Bistreț.

Rezumat. Observații noi privind avifauna acvatică din ROSPA0010Bistreț (S-V României). În studiul de față redăm câteva aspecte noi din structura comunităților de păsări acvatice din Ordinele Pelecaniformes și Charadriiformes, cantonate în ROSPA0010Bistreț din lunca Dunării (S-Vestul României), în sezonul vernal și estival (lunile mai-iulie), în anii 2013 și 2020. Observăm că biotopurile din zona lacului Bistreț sunt în continuă transformare, mai ales ca urmare a abandonării activităților piscicole care se derulau aici până în anul 2006. Acest fapt influențează în mod pozitiv compoziția și densitatea avifaunei acvatice. Un factor important care stă la baza modificărilor în spectrul avifaunei acvatice a SPA Bistreț este cel climatic. În ultimii ani, marcați de cantități mici de precipitații, constatăm o creștere semnificativă a numărului de pelicani (ex. *P. onocrotalus* cu un maxim numeric de 500 de ex., adulți și imaturi), ale căror cerințe de hrănire sunt îndeplinite de bazinele acvatice cu nivel al apei scăzut sau mediu. Condițiile ecologice actuale au creat oportunități trofice și au favorizat stabilirea mai multor specii cuibăritoare coloniale sau solitare ale Ord. Pelecaniformes (*Botaurus stellaris*, *Ixobrychus minutus*, *Nycticorax nycticorax*, *Ardeola ralloides*, *Egretta garzetta*, *Ardea purpurea*, *Platalea leucorodia*, *Plegadis falcinellus*), însă fluctuațiile periodice ale nivelului apei influențează mai ales dinamica speciilor și populațiilor de păsări din Ord. Charadriiformes. Dintre acestea din urmă evidențiem câteva specii care s-au stabilit la cuibărit în mai mulți ani succesivi (*Himantopus himantopus*, *Vanellus vanellus*, *Limosa limosa*, *Chroicocephalus ridibundus*, *Chlidonias hybrida*), sau după o absență îndelungată în sezonul de reproducere: *Glareola pratincola* și *Sternula albifrons*. Deși sunt specii de interes faunistic și conservativ, înscrise și în Directiva Păsări a CE, *Glareola pratincola* și *Sternula albifrons* nu sunt înscrise în fișa standard a sitului Bistreț, probabil din cauza absenței lor în perioada de documentare și înscriere a lacului în rețeaua de situri Natura 2000, fapt pentru care se impune o monitorizare specială și punerea sub protecție a coloniilor, dacă acestea se mențin în interiorul ariei protejate. De asemenea pentru viitor trebuie avută în vedere revizuirea fișei standard a sitului pentru ca noua comunitate de păsări să beneficieze de măsuri concrete de conservare.

Cuvinte cheie: avifauna acvatică, Ordin Pelecaniformes, Ordin Charadriiformes, ROSPA0010Bistreț.

INTRODUCTION

The Bistreț Lake is located in southwestern Romania, about 5 km away from the Danube River and it is the wetland with the most extensive body of water in the Danube Floodplain, located between the Iron Gates and the confluence between the Olt and the Danube Rivers. It is the result of the systematization of an old complex of ponds (Bistreț-Cârna-Nasta-Nedeia), which covered an area of about 22,000 ha in the past (COTEȚ, 1957). After the systematization started in the Danube Floodplain in 1967, the lake was reduced to a surface of 1,936 ha and it was arranged as an agro-piscicultural accumulation. The aquatic surface was divided into four large main basins and two smaller basins (used as a nursery), the water level being maintained through drainage channels. Though small in terms of surface and with greatly modified ecosystems, the Bistreț Lake, like other wetlands from the Danube Floodplain, has always been a place of refuge for birds moving along the Danube (RIDICHE 2012, 2018; RIDICHE & ORZAȚĂ, 2004; RIDICHE et al. 2006; RIDICHE & MURARIU, 2009; RIDICHE & KISS, 2011; RIDICHE & SÁNDOR, 2016; VESPREMEANU 1964; TÁLPEANU 1963a,b, 1965, 1968).

In 2006, the Bistreț agro-piscicultural accumulation was severely damaged by a strong flood occurred along the Danube (resulting from the creation of breaches in the protection dams in Rast-Bistreț sector) and, consequently, the activities related to intensive fish farming were abandoned. In the years that followed, the water basins underwent a process of renaturation, which mainly consisted in the extension of marsh vegetation that, until 2006, was restricted to a few small islands or riparian belts. At the same time, the water level in the basins was no longer regulated according to the agricultural interests, but it self-regulated depending on the meteorological and hydrological conditions of the area. Therefore, since 2007-2008, there has been some diversification in the structure of the aquatic avifauna, but especially a remarkable increase in the numbers of several species, both those in transit and those nesting in the area (RIDICHE, 2012).

Starting with 2007, most of the lake surface was integrated in the *Natura 2000* ecological network with the status of *Special Avifauna Protection Area* (code ROSPA0010Bistreț) (***, 2007) – Fig. 1.

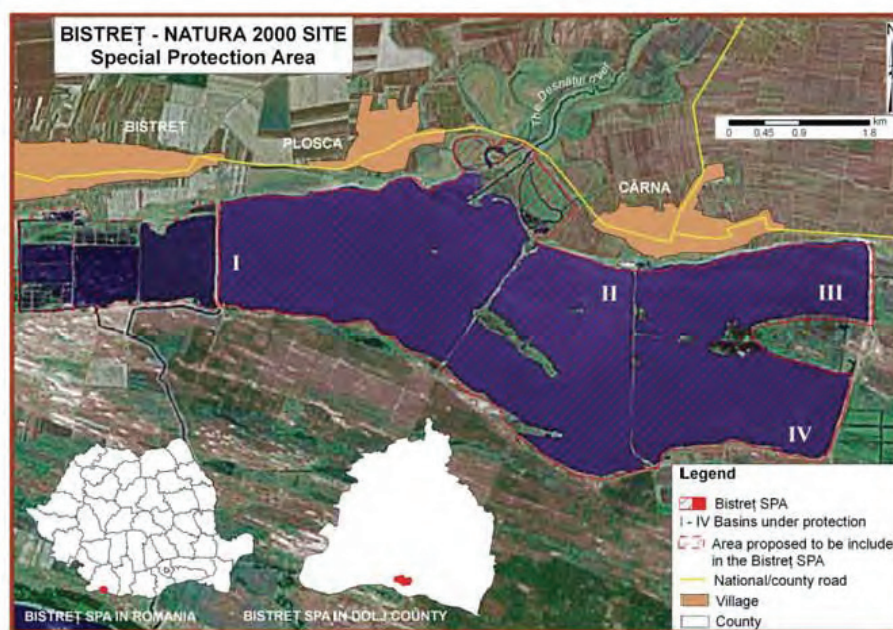


Figure 1. The location of the Bistreț Lake and perimeter of ROSPA0010Bistreț (Background Image-Landsat7) (Source: RIDICHE & LICURICI, 2009).

MATERIAL AND METHODS

We mainly took into consideration the results of the observations made in 2013 and 2020, when we organized 4 trips to the site, during the breeding seasons: the same number of observation trips in the vernal season of both years, 2013 and 2020 (May 1 – June 15) and two trips during the summery (aestival) season 2013, 2020 (June 15 – July 15). However, our research was also carried out in the intermediate years, but without a well-established schedule during the seasons corresponding to the breeding period of the birds. The observations were made from fixed points and on routes, along the aquatic basins according to the methodology formulated by BIBBY (2000).

The fixed points were established based on the visibility and density of bird species and populations. We collected the best results in the area of the mouth of the Desnățui River in Bistreț Lake and on the island of Ostrovogania (basin II), but also on the route between the former administrative building of the fishery (Cârna locality) and the separation dam between basins I and II. The route on the Mălăieni dam, located at the western limit of the site, allowed us to observe the stationary birds from basin I and from the western aquatic basins that are not included in SPA Bistreț, but which host or are transited by bird species that populate the perimeter of the site.

As instruments for field research we used a pair of binoculars (Zeiss Jena 10x50) and a telescope Leica (APO Televid 82 mm spotting scope, angled eyepiece; 25-50x WW ASPH Vario eyepiece), Philip's illustrated guide and a camera (Sony 15x and Nikon Coolpix p900). In the data processing and elaboration of the study we used the specialized literature mentioned in the bibliography.

The systematic classification and the names of the species were made according to the modern, current nomenclature (<http://avibase.bsc-eoc.org>).

RESULTS AND DISCUSSIONS

The aquatic species that benefited the most from the habitat transformations and the new living conditions from SPA Bistreț belong to the Pelecaniformes and Charadriiformes Orders.

In Table 1, there are rendered the species belonging to the Pelecaniformes and Charadriiformes Orders that were observed during our research in the bird breeding seasons: vernal (May 1 – June 15) and summery (June 15 – July 15).

Table 1. List of species belonging to the Pelecaniformes and Charadriiformes Orders recorded in the vernal (May 1 – June 15) and summery (June 15 – July 15) seasons in 2013 and 2020 years within ROSPA0010 Bistreț.

Order	Family	Species	Standard data form
PELECANIFORMES	Ciconiidae	<i>Ciconia ciconia</i> (Linnaeus, 1758)	x
		<i>Ciconia nigra</i> (Linnaeus, 1758)	x
	Pelecanidae	<i>Pelecanus onocrotalus</i> Linnaeus, 1758	x
		<i>Pelecanus crispus</i> Bruch, 1832	x
	Ardeidae	<i>Botaurus stellaris</i> (Linnaeus, 1758)	x
		<i>Ixobrychus minutus</i> (Linnaeus, 1766)	x
		<i>Nycticorax nycticorax</i> (Linnaeus, 1758)	x
		<i>Ardeola ralloides</i> (Scopoli, 1769)	x
		<i>Egretta garzetta</i> (Linnaeus, 1766)	x
		<i>Ardea alba</i> (Linnaeus, 1758)	x
		<i>Ardea cinerea</i> Linnaeus, 1758	x
		<i>Ardea purpurea</i> Linnaeus, 1766	x
	Threskiornitidae	<i>Plegadis falcinellus</i> (Linnaeus, 1766)	x
		<i>Platalea leucorodia</i> Linnaeus, 1758	x
	Phalacrocoracidae	<i>Phalacrocorax carbo</i> (Linnaeus, 1758)	x
		<i>Microcarbo pygmaeus</i> (Pallas, 1773)	x
CHARADRIIFORMES	Recurvirostridae	<i>Recurvirostra avosetta</i> Linnaeus, 1758	x
		<i>Himantopus himantopus</i> (Linnaeus, 1758)	x
	Charadriidae	<i>Charadrius dubius</i> Scopoli 1786	x
		<i>Vanellus vanellus</i> (Linnaeus, 1758)	x
		<i>Limosa limosa</i> (Linnaeus, 1758)	x
		<i>Calidris pugnax</i> (Linnaeus, 1758)	x
		<i>Tringa ochropus</i> Linnaeus, 1758	x
		<i>Tringa totanus</i> (Linnaeus, 1758)	x
		<i>Actitis hypoleucos</i> (Linnaeus, 1758)	x
	Glareolidae	<i>Glareola pratincola</i> (Linnaeus, 1766)	-
	Laridae	<i>Chroicocephalus ridibundus</i> (Linnaeus, 1766)	x
		<i>Larus cachinnans</i> Pallas, 1811	x
		<i>Sterna hirundo</i> Linnaeus, 1758	x
		<i>Sternula albifrons</i> (Pallas, 1764)	-
		<i>Chlidonias niger</i> (Linnaeus, 1758)	x
		<i>Chlidonias hybrida</i> (Pallas, 1811)	x

Most of the species are listed in the standard data form of ROSPA0010 Bistreț and benefit from adequate protection measures, according to the Site Management Plan (***. 2016). The species *Glareola pratincola* and *Sternula albifrons* are not listed in the standard data form of SPA Bistreț, probably due to their absence during the documentation and registration of the lake in the Natura 2000 network. As *Glareola pratincola* and *Sternula albifrons* are species of faunal and conservative interest, also included in Annex I of the EC Birds Directive (***. 2009), a special monitoring and protection of their colonies is required, if they remain within the protected area.

Although we do not have concrete figures for all the species in question, the data resulting from our own observations during the last 7 years, compared to those specified in the specialized literature, provide us with sufficient benchmarks for some qualitative and quantitative comparisons – Table 2.

In the following we present the situation of the species / families that are in a new situation or experiencing a positive trend.

We notice an increasing trend of the numbers of most species of Pelecaniformes Order, which may be induced by the accessible trophic supply and favourable living conditions for many colonial species due to the renaturalization of the habitats within the study site, but also general increasing trends of the populations due to the measures mentioned in the Management Plans of the Protected Areas.

Table 2. The dynamics of the species belonging to the Orders Pelecaniformes and Charadriiformes, during the vernal (May 1 – June 15) and summery (June 15 – July 15) seasons, in 2013 and 2020 years, within ROSPA0010 Bistreț.

Species	Benchmarks from the years 2000-2010	New personal observations	
		2013	2020
<i>Ciconia ciconia</i>	Frequent, unrefereed (RIDICHE, 2012)	2-8 ind. (adults)	3-7 ind. (adults)
<i>Ciconia nigra</i>	Constant presence of reduced numbers of individuals (2-7) - RIDICHE & ORZAȚĂ, 2004; RIDICHE & KISS, 2011.	2-4 ind. (adults)	4 – 11 ind. (adults)
<i>Pelecanus onocrotalus</i>	Between 20 and 40 ind. in 2005, 2007-2008 (RIDICHE, 2012)	12-300 adult and immature ind.	about 500 adult and immature ind.
<i>Pelecanus crispus</i>	Maximum 20 ind. in 2004 and 2005 and about 120 ind. in 2008 (RIDICHE, 2012)	7 -12 ind.	-

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<i>Botaurus stellaris</i>	Very rare (RIDICHE & ORZAȚĂ, 2004; RIDICHE, 2012)	6-12 pairs (males singing).	3-4 pairs (call of males)
<i>Ixobrychus minutus</i>	Frequent, unrefereed (RIDICHE, 2012)	10-24 pairs (males singing).	10-14 pairs (call of males).
<i>Nycticorax nycticorax</i>	70 ind. (adults and immatures) - RIDICHE & ORZAȚĂ, 2004; about 150 ind. in 2007-2008 (adults and juveniles) – RIDICHE, 2012	10-16 ind. (adults)	About 50 ind. (adults and immatures).
<i>Ardeola ralloides</i>	100 -120 ex (adults and juveniles) between 2001-2005 and 2-14 ind. (2007-2009) – RIDICHE, 2012	50-60 ind. (20-30 pairs)	80-100 adult and immature ind.
<i>Egretta garzetta</i>	20-150 ind. in 2007-2008 (RIDICHE, 2012)	50-80 ind.	150-200 adult and immature ind.
<i>Ardea alba</i>	Absent in May-June (RIDICHE, 2012)	-	15-25 ind.
<i>Ardea cinerea</i>	Frequent but not numerous (RIDICHE, 2012)	20-30 adult and immature ind.	about 100 adult and immature ind.
<i>Ardea purpurea</i>	30-40 nesting pairs (RIDICHE & ORZAȚĂ, 2004), then, after 2006, rare individuals (RIDICHE, 2012)	20-40 adult and immature ind.	40-50 adult and immature ind.
<i>Plegadis falcinellus</i>	Accidental (RIDICHE & ORZAȚĂ, 2004); sporadic, max. 5-11 ind. (RIDICHE, 2012)	25 ind.	50-70 ind.
<i>Platalea leucorodia</i>	Absent during the vernal-aestival season until 2006 (RIDICHE et al., 2006), 120-166 pairs (PAPP & FĂNTĂNĂ, 2008), 80-100 ind. in 2007-2008 (RIDICHE, 2012)	-	100-120 ind. (adults)
<i>Phalacrocorax carbo</i>	30 - 80 ind. in 2007 and 2008 (RIDICHE & KISS, 2011; RIDICHE, 2012)	Numerous flocks in transit	50-100 ind., more numerous in transit
<i>Microcarbo pygmaeus</i>	20-50 ind. in 2007 and 2008 (RIDICHE, 2012)	50-100 ind. in transit or stationary	250-350 ind. (adults and immatures)
<i>Recurvirostra avosetta</i>	About 50 ind. in 2004, 30-80 ind. in 2007-2008 (RIDICHE, 2012)	-	50-60 ind. (adults and immatures)
<i>Himantopus himantopus</i>	3-5 pairs in 2000-2004 (RIDICHE & ORZAȚĂ, 2004); 20-40 pairs in 2007-2009 (RIDICHE, 2012)	15-30 ind. (8-15 pairs)	30-50 adult and juvenile ind.
<i>Charadrius dubius</i>	4-10 ind. in 2007 and 2008, possible nesting (RIDICHE, 2012)	Not observed	Not observed
<i>Vanellus vanellus</i>	Tens of individuals (RIDICHE, 2012)	80 ind. (40-60 pairs)	50-60 ind. (10-20 pairs)
<i>Limosa limosa</i>	6-8 pairs (KISS & MARINOV, 2005), 15-25 pairs (RIDICHE, 2012)	30 ind.	90-100 adult and juvenile ind.
<i>Calidris pugnax</i>	Isolated individuals (RIDICHE & KISS, 2011)	About 40 ind. by the end of the aestival season	About 220 ind. at the beginning of the vernal season
<i>Tringa ochropus</i>	Not reported	60 ind.	7 ind. (adults)
<i>Tringa totanus</i>	Rare until 2004 (RIDICHE & ORZAȚĂ, 2004), relatively frequent in 2007-2009, but in small and oscillating numbers (2-12 pairs) – RIDICHE, 2012	20-30 ind. (10-15 p.)	-
<i>Actitis hypoleucos</i>	Frequent, but in small and oscillating numbers (2-12 pairs) – RIDICHE, 2012	-	-
<i>Glareola pratincola</i>	-	-	4-8 adult ind. (2-4 pairs)
<i>Chroicocephalus ridibundus</i>	Numerous (RIDICHE, 2012)	40 ind. (adults and youngs)	About 300 ind. (adults and immature)
<i>Larus cachinnans</i>	Unrefereed (RIDICHE, 2012)	35-40 ind.	Low number of ind., in transit, unrefereed.
<i>Sterna hirundo</i>	About 120 ind. in 2005 and about 150 ind. in 2008 (RIDICHE, 2012)	-	8-12 ind. in transit
<i>Sternula albifrons</i>	Absent during 2000-2006, rare during 2008-2010 (max. 5-10 pairs) – RIDICHE, 2012	-	6-8 adult ind. (3-4 pairs)
<i>Chlidonias niger</i>	6-8 ind. in 2004, 12-20 ind. in 2007 and 2008 (RIDICHE, 2012)	-	40-60 adult ind.
<i>Chlidonias hybrida</i>	50-60 ind. in 2004-2005 and 150 ind. in 2008 (RIDICHE, 2012)	300-500 ind. (adults and juveniles)	200-300 ind. (adults and juveniles)

Legend: ind.. – individuals (bird specimens)

Pelecanus species come here for feeding and have variable numbers depending on hydro-climatic conditions, their feeding requirements being met by shallow or medium water level basins. If until 2008-2010 *Pelecanus crispus* was frequent and numerous in the area, now it is much rarer and less numerous, but we do not have any viable explanation of the phenomenon so far. Instead, we observed a high frequency and a significant increase of the common pelican populations, *P. onocrotalus*. For example, on June 17, 2019 we registered about 250-300 individuals, and on June 26, 2020 we recorded a maximum number of 500 individuals; about 80-85% of them were adults and 15-20% were unusually numerous immature individuals (Fig. 2a). We do not know the origin of these populations of *Pelecanus onocrotalus*, but we know that quantitative increases (approx. 17,000 pairs) are also reported in the largest colony in the Danube Delta (respectively in Europe), following the estimates made by modern technological methods (drones, GPS) - MARINOV et al. 2016; KISS et al., 2019. An interesting phenomenon is, however, the presence of immature individuals, which usually, remain in the wintering places where they change their plumage, and in the 3rd year of life

they return to their native places (LINȚIA 1955; CĂTUNEANU et al. 1979). KISS et al. (2020) provided information about the spatial and temporal model of postnuptial migration of common pelicans that nested in the Danube Delta, but the phenological dynamics of the young populations of *P. onocrotalus* that came to feed on Bistreț Lake remains an open topic for future research.

Most of the species of the family Ardeidae remain stable or slightly increase in numbers (e.g. *Egretta garzetta*, *Ardea cinerea*, *A. purpurea*, *Ardeola ralloides*), but we recorded a reduced presence in the species *Ixobrychus minutus* and *Botaurus stellaris*, and we have not identified the reason for this numerical decrease so far. We notice a new situation in case of *Ardea alba*, which is currently among the summer species of the site (Fig. 2b), while in the past, it was recorded mainly during the spring-autumn migrations (passage species) and sometimes in winter (RIDICHE et.al, 2006, RIDICHE 2012).

At the same time, the species of Treskiornitidae (*Plegadis falcinellus* and *Platalea leucorodia*), undergo a much better period in terms of distribution and numbers within the site. Their behaviour and presence in several points of SPA Bistreț during the entire breeding season encourages us to consider them among the species nesting in the macrophytes that abound in all four water basins of the site.

In case of the Phalacrocoracidae family, we notice a revival of the *Microcarbo pygmaeus* species that has become a summer species well represented numerically within SPA Bistreț (over 250-300 individuals). The presence of immature individuals is an indicator that the species has built its nesting colonies within the site and / or in its vicinity (e.g. in the reed thickets from Nedeia - Măceșu de Jos pool), but this assumption remains to be verified in the future.

The dynamics of bird species and populations of the Charadriiformes Order is more dependable on the periodic fluctuations in water levels, but also on the new ecological conditions resulting from the abandonment of fishing activities. The reduction of beach areas or marshy shores and of swampy surfaces as a result of the expansion of reed and rush thickets may be one of the factors that contributed to the reduction or absence of summer limicol species that had settled here during 2006-2009 (*Charadrius dubius*, *Calidris pugnax*, *Tringa totanus*, *Actitis hypoleucos*, etc.). However, there are some species that have nested continuously, such as *Himantopus himantopus*, *Vanellus vanellus*, *Limosa limosa*, *Chroicocephalus ridibundus*, *Chlidonias hybrida*, which can be often seen in mixed colonies concentrated in a few points within the Bistreț site (e.g. near the mouth of the Desnățui River, on the island of Ostrovogania) - (Fig. 2c),.

An ornithological novelty for Bistreț wetland is the return of the *Glareola pratincola* species after a long absence during the breeding season.

It is the first time after 1965 when we rediscover the species *G. pratincola* in this area. With regard to *G. pratincola*, TĂLPEANU (1963 a, b) mentioned that he found it in large numbers (over 100 individuals), in the period May – July 1960, on the saline lands near the Strâmba Pool (west of Bistreț Lake, between Negoii and Rast); then, during the observations made in May-July, 1960-1963, he collected 4 males of *G. pratincola* at Bistreț and Dăbuleni (TĂLPEANU, 1965). Two of the individuals collected by Tălpeanu at Bistreț were donated and are preserved in the patrimony of the Oltenia Museum Craiova (RIDICHE, 2011). After the construction of the dam within the Danube Floodplain and the systematization of Bistreț Lake, many of the rare species (including *G. pratincola*) no longer nested in the area, the new factor disturbing them being the constant and active presence of people (TĂLPEANU, 1968).

We recorded a small number of individuals on June 4, 2020 (8 individuals) and June 26 (4 individuals) on the Ostrovogania Island, among the vegetation with species of *Xanthium italicum* but also in fast flights accompanied by alarm sounds. Throughout the observations, the species manifested a behaviour of territorialism and / or defense that it usually adopts during the period and at the nesting place (HAGEMEIJER & BLAIR, 1997). Although we did not find nests with eggs or chicks, we still have these clues that entitle us to claim that the species settled for nesting in the perimeter of SPA Bistreț (Fig. 2e, f). The Ostrovogania island is a place less exposed to anthropogenic factors, due to its isolation and difficult accessibility, especially when that the water level in the surrounding basin is high. The fact that the population of *G. pratincola* established here is still small could be explained by the presence of predators on the island (e.g. *Corvus* sp., *Canis aureus*) and by the inconvenience caused by people when the water level is low enough and they create access paths to the island.

Among the Laridae, we notice the numerical decrease and even the absence of the species *Sterna hirundo* and the return of the species *Sternula albifrons* and *Chlidonias niger*, which had a sporadic presence in many years in the past. However, their numbers are very small (max. 6-8 ind. of *S. albifrons*) or moderate (40-60 ind. of *C. niger*), and their presence was noticed together with other Laridae species (*Chlidonias hybrida*, *Chroicocephalus ridibundus*) or limicol species (*Himantopus himantopus*, *Limosa limosa*), mainly in the area where the Desnățui River flows into the lake and, respectively, in the northeastern limit of Ostrovogania Island (Fig. 2d.).

CONCLUSIONS

The history of ornithological research in the area of the Bistreț Lake shows us that this wetland is constantly changing and offers us new and interesting aspects in the structure of bird communities.

The qualitative-quantitative composition of the communities of aquatic birds belonging to the Pelecaniformes and Charadriiformes Orders have continuously modified, and, some species have also registered significant changes in numbers over the years.

The considerable proportion of *Pelecanus onocrotalus* sub-adults may indicate significant changes in the phenology of this species.

We attribute the qualitative / quantitative enrichment of the ornithofauna to the abandonment of the previous activities related to intensive fish farming, followed by the spontaneous renaturation of the habitats from the site under study.

We also included in this causality the discovery of a small population of *Glareola pratincola* that gave us indications of nesting in the area, as well as the return of some rare or sporadic species (*Sternula albifrons*, *Chlidonias niger*) for nesting.

The research revealed remarkable changes in the ornithological biodiversity, which require the revision of the standard data form of the Bistreț site and even a subsequent rectification of the site boundaries.

For a decent management of the area, a continuous monitoring of the avifauna is required in the future as well.

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Ridiche Mirela Sabina

The Oltenia Museum, Nature Sciences Department, Popa Șapcă Str., No. 8, Craiova, Romania.
E-mail: ridichemirela@gmail.com, rimirela@yahoo.com

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a. *Pelecanus onocrotalus* – June 25, 2020



b. *Ciconia nigra*, *Ardea alba*, *Platalea leucorodia*,
Plegadis falcinellus - June 25, 2020



c. *Himantopus himantopus* and *Limosa limosa*
(adult and juvenile individuals) – June 4, 2020



d. *Chroicocephalus ridibundus* and *Sternula albifrons*
June 25, 2020



e. *Glareola pratincola* - June 04, 2020



f. *Glareola pratincola* - June 04, 2020

Figures 2. Aspects with observed bird species during the vernal (May 1 – June 15) and summery (June 15 – July 15) seasons, 2020 year, within ROSPA0010 Bistreț (originals photos).