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ECOLOGICAL RESTORATION PROJECT "CIOBARCIU-COSTULENI" (IASI - ROMANIA): MONITORING OF THE BIRDS' FAUNA EVOLUTION

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SYNOPSIS

The Ciobarciu wetland represents the first wetland result of an ecological restoration project developed in the Romanian basin of the Prut River. The wetland area appeared in October 2006. Our study is the results of a birds' monitoring program started during the spring of the year 2007 and that is going on, in order to propose this new wetland for a protected status in the national Natura 2000 network. We found gulls and terns like the first breeding species in the 2007' summer, but the observations done during the 2008' spring give us information about a bigger number of the potential breeding species. The wetland perimeter was used for seeking food by a large number of bird species, especially, during the migration period when the birds' diversity increased obviously (waterfowls, herons, waders, gulls, terns, etc.). The principal threatening factors are represented by the water's level oscillations and the hunting.

INTRODUCTION

The Old Jijia River represents the last 56 kilometres of the initial river's course (with large meanders) that was cut-off through a short channel excavated from Chiperesti directly to the Prut River course during the hydrological arrangements done in the Prut River basin following to control the flooding risk and to extent the agricultural lands during the '70 – '80 years of the last century. Step by step, the quality of these lands free of the yearly flooding regime decreased and the agricultural importance was falling down leaving place to the surfaces covered by small herbs and salty soil areas. Even the grazing availability of these territories became low. During the last decade, the local community used it especially for the extensive grazing.

The Ciobarciu wetland was created in 2006, through an ecological restoration project developed in Iasi County, by the "Institute for Inland Water Management and Waste Water Treatment" Riza, Netherlands and the "National Company Romanian Waters – Prut Direction". The project followed to balance the water's necessity in this territory strongly affected by long periods of dryness, to decrease the flooding risk in

the area and to increase the biodiversity of the region. The wetland is situated at 23 km south-east from Iasi city, near Costuleni village, very close to the national road DN 24, Iasi – Albita.

The Ciobarciu wetland's total surface is about 250 hectares, receiving waters from Old Jijia River through the hydrological junction Chiperesti, from Comarna and Covasna brooks, but also from rainfalls. The aquatic surface is represented by four ponds; at a normal waters' level, only two ponds have water about 0.5 – 1 meter depth and the third present small puddles and swampy areas while the forth can receive waters from the Prut River (that is passing at 1 – 1.5 km distance) in case of flooding risks.

The first flooding of this area was done in October 2006. The water's level had oscillated and still representing the more important threats for the bird's fauna evolution. If the initial idea of the project was to imitate the natural two periods of flooding, the experience of the two summers (2007 and 2008) shows that it seems to be better to keep water in this wetland the whole year. In 2007' summer, one very dry, without rainfalls for more than two months, the flooded Ciobarciu area was a true oasis in this region, keeping a good level of water in it surroundings, very important offer for the local community that uses these perimeters like grazing surfaces. During the second part of May 2008, the water was lost through the outlet junction Ciobarciu; at beginning of the June, the area was near dry, existing just few puddles in two ponds.

The climate is temperate-continental. The specialists mention a constant increase of the medium temperature: from 9.2 ^{0}C in the '80 years to 10.2 ^{0}C in the last decade of the 20th century and the trend is still positively. The dryness is normal for this area.

In the area, were created different habitats for birds: open aquatic surfaces, small islets, flooding meadows and hay fields. The specific wet vegetation (*Typha sp*., *Phragmites sp*., *Schoenoplectus sp*. and *Scirpus sp*.) is spreading quickly. In the wetland' surroundings there are high herbs surfaces, large grasslands and, no far away, some woodlands. In western part, there are gliding hills, fixed through a forest plantation and presenting open claying walls.

For the fauna there are not available data excepting the fishes presence after about one year from the flooding moment (PhD Grigore Davideanu, from the NGO Aquaterra, *in verbis*) – there were recorded 8 fish species. Due our field observations, we can notice the presence of different aquatic and terrestrial invertebrates groups, amphibians, reptiles and some small mammals.

METHODS AND PERIOD OF STUDY

The birds' monitoring program was started during the spring of the year 2007 and it is going on, in order to bring enough data to propose this perimeter for a protected status, including like part of the national Natura 2000 network. We are using

the transect method, observation from fixed point, males' sound's counting and band counting (for waders and aquatic birds).

RESULTS AND DISCUSSIONS

There is no any study before the hydrological arrangements of the area. But this territory is part of the Prut River valley that represents a very important flyway for the birds' migration in the eastern part of Romania (Gache, 2002). On the ancient maps, this area was flooded every spring, representing an ideal site for aquatic birds and waders offering feeding resources, resting and even breeding suitable habitats. But due the embankments along the Prut River and the cut-off of the Old Jijia River, the plains lost the periodically flooding regime and became dry. The birds' fauna became also poor, including like breeding species just few passerines species, the Grey Partridge (*Perdix perdix*) and quail (*Coturnix coturnix*), while the area was still offering good sites for the raptor species breeding in the surrounding woodland. Till the ending of last decade, flocks of wetland birds were seen passing to or from Osoi fisheries, situated at 6 km in north (Gache, 2002), representing a good place for breeding and rest of birds in this region (Munteanu & co, 2002). But the fishery was closed due the high costs and low productivity (the water was pumped in from Prut River) and the birds abandoned this territory.

Because the first flooding of the area was done in October 2006, the first aquatic birds stopped there in that autumn, during the migration period. In this moment, the birds' fauna list consists in 105 species (table 1) and we expect an increasing of this number in the next future period (we assume the present study like a preliminary one). Between the recorded bird species, we notice the presence of 29 bird species included in the Annexe 1 of the Birds' Directive (species that need special protection management measures in order to preserve their actual effectives and avoid the disappearance risk) and 19 species are present in the Romanian Red Book of Vertebrates (Botnariuc, Tatole & co, 2005).

As it is normally, especially for a new appeared wetland, this perimeter was used for seeking food by a large number of bird species during the migration period when the birds' diversity increased obviously (waterfowls, herons, waders, gulls, terns, etc.).

In the spring, the birds are going to the breeding areas and the migration is rapidly; we notice the constant presence of the aquatic or marshes birds and waders, too, with effectives about hundreds individuals, but the birds species' list is changing every week. At the beginning of March, the ducks are dominant, forming groups about 450 – 520 individuals (*Anas crecca*, *Anas platyrhynchos*, *Anas penelope* and *Aythya ferina*), but there appear also the first flocks of herons (*Ardea cinerea* and *Ardea alba*), White Storks (*Ciconia ciconia*) and waders (*Vanellus vanellus* and *Limosa limosa*). During the April till the first middle part of May, the waders become dominant, someday, could be possible to count more than one thousand individuals in one day of fieldwork – one by one, the dominant species are *Vanellus vanellus*, *Limosa limosa*

and *Philomachus pugnax*, but other species can be present with significantly effectives, about tens to one hundred exemplars, also (*Calidris ferruginea*, *Tringa glareola*, *Tringa totanus* and *Tringa erythropus*). We mention the presence of one rare species in the area, *Himantopus himantopus* with a very high effective in one day – 48 individuals, on 11.05.2008.

For the breeding season, we observed two different situations. We found Moorhen (*Gallinula chloropus*), Coot (*Fulica atra*), gulls (*Larus ridibundus* and *Larus cachinnans*) and terns (*Sterna hirundo* and *Chlidonias hybridus*) like the first breeding species in the 2007' summer, but the observations done during the 2008' spring give us information about a bigger number of the potential breeding species. In the first middle part of May 2008, we could follow different breeding behaviours for several species - the mating display, the nest building and the eggs' incubation – including the presence of some rare breeding species like *Aythya nyroca*, *Himantopus himantopus* or *Chlidonias niger*. But there was took a decision for outlet the water from the ponds because a hydrological warning and the rainfalls were not so abundant as they assumed. After this moment, the continuously lost of water, chanced radically the wetland's aspect in the June's beginning – on the 4th June, the ponds were near dry, just with very small puddle, so, the aquatic and marshes birds were disappearing from the area, probably loosing this breeding season. One moth later, after the water's inlet, we could observe one - two females with chicken for some aquatic species like *Anas platyrhynchos*, *Anas querqudula*, *Gallinula chloropus*, *Fulica atra* and *Tachybaptus ruficollis*.

As we saw during the 2007' summer, when is flooding, the wetland can offer food resources and places for rest or refuge for groups of immature aquatic birds (especially, ducks that can breed there in the next years), marshes birds (herons, egrets, spoonbills) and waders. Probably, part of the pairs that started to breed in the 2008' spring, were used the wetland perimeter like feeding and refuge territory in 2007.

By other hand, the storks that are breeding in surroundings are using this perimeter to seeking food: *Ciconia ciconia* was recorded with 76 individuals on 24.05.2007, while, in June 2007, we observed 54 exemplars of *Ciconia nigra*, which can breed in the neighbourhood woodlands (along the Prut River valley or on the hills from western side of the Old Jijia River and Ciobarciu wetland). We suppose that in these woodlands could breed, also, some raptors species recorded with adults and juveniles during every fieldtrip in the area; we intent to search during the next winter the nests of raptors and Black Stork in the area.

The autumn migration is slowly and under a waves form movement, especially for some wader species that are crossing through the area, flocks by flocks, being apparently a constant presence beginning with the July's end till the end of November (*Vanellus vanellus* or *Limosa limosa*), but the ducks and the geese are present, too, with effectives of hundreds exemplars. During this last autumn month, we recorded the winter visitors' arrival in the area. The 2007's winter had a quiet warm weather so, it is difficult to assume that the recorded situation represent a rule for Ciobarciu

wetland. As we see in the table 1, there were present groups of swans, geese and ducks.

The ecological restoration project done in the area Ciobarciu-Costuleni can be considered a success for biodiversity and the local community, too. There exist now a wetland about 250 ha that shelters a great number of water and marshes bird species, some of them with significant effectives during the migration period but also the first breeding bird species. The experience of the first two years, give us an idea of water's level management – if during the 2007' summer, the water was present in the ponds, the first bird breeding pairs appeared in the wetland, having a successfully breeding season. In May 2008, we met birds in mating display, building nests or in the incubating period, but because the water was lost, in the ending of May – June's beginning, the majority of these birds were abandoned the area. It is obviously, that it is necessary to keep the water in ponds at least for the period May's beginning – middle July, in order to record breeding success of the birds.

The results of our monitoring permit us to estimate that this new wetland resulted through the ecological restoration programme can become easy and rapid a very important birds' breeding area and a permanent migration halt site for numerous aquatic birds and waders species. The position of Ciobarciu wetland is on the birds' eastern migration flyway (along the Prut River valley), a very important migration road for the birds in Romania, going to and from the Danube Delta and western coast of the Black Sea. As we saw during our fieldworks, the suitable habitats for birds have a positive evolution.

Not in the end, the local community manifest an open attitude for the area's protection (during these near two years of the wetland's existence, the people from Costuleni village had contacted the Prut Direction – Romanian Waters' Administration every time when they recorded different events – illegal hunting, great oscillations of the water's level, etc.) and they are using the area and it' surroundings for grazing and for fishing.

The major threats for the birds' presence are the oscillations of the waters' level and the hunting. The specialists try to find the best solutions to avoid the waters' lost in the area. As we observed during the 2008' spring, the bird breeding pairs leave the area if the water's level decreases and the dryness takes it place. The water's level in the wetland can be increased utilising the hydrological junction from Chiperesti. It is also necessary a coordination of decision about the opening/closing of the water outlet of Ciobarciu wetland taking care about the water's necessities of the wetland itself in order to obtain an ecological balance and the local community's necessities.

The new wetland is situated in the perimeter of one old hunting territory, delimitated for the mammals and quails' hunting. But the experience of the 2007's autumn demonstrated that the hunters can shoot different aquatic birds despite the fact that these species are not appearing in the list of fauna present on this hunting territory (so, they have not hunting permission for these species), The hunters ignored not only the status of private ownership, but also the primary objective of the ecological restoration project developed in this area: to achieve an increase of the region's biodiversity through the re-appearance of an historical wetland.

It is also necessary to have a good control of the grazing in this territory regarding the effectives, the period and the places where the local community can bring their animals (sheep, cows, horses). As we observed during our fieldworks, sometimes, the effectives are bigger then the ecosystem can support ecological viewing. The management plan of the wetland must include rules for the grazing places, especially, for the birds' breeding season. The grazing activity can improve and mention the quality of some habitats if the local community understand and respect some specifically rules.

In order to protect this territory, the National Company Romanian Waters – Prut Direction, with the scientifically support of the specialists from "Al.I.Cuza" University, finalised the documentation to obtain a protection status (the document was sent to the Romanian Academy and Romanian Environmental Minister). The principal owner is the National Company Romanian Waters – Prut Direction, just around 50 ha of the area being in the possession of other small private owners (that, now, intent to sell the land to the National Company Romanian Waters – Prut Direction). Into a partnership with two important NGOs – Romanian Ornithological Society/BirdLife Romania and Aquaterra Iasi – there were initiated the first steps to elaborate, develop and implement a management plan for this new appeared wetland, using the accumulated experience and the results of the birds' monitoring.

This ecological restoration project represents just one part of a large ecological restoration work the will be develop in the Prut River's basin, in order to create small wetlands on the tributary rivers and on the Prut River valley too, like a "string of pearls" in order to balance the local communities' necessities, the waters' dynamic and to increase the biodiversity in this region.

CONCLUSIONS

The ecological restoration project "Ciobarciu-Costuleni" represents a success for biodiversity and the local community.

The wetland sheltered the first aquatic bird breeding species, but began to represent an important halt place during the birds' migration and a good feeding territory for numerous birds.

It is necessary to obtain a protection status for this wetland in order to control the hunting activity.

The principal owner with the support of other partners will elaborate a management plan for the wetland in order to monitoring the biodiversity's evolution and dynamic, identify and implement other hydrological arrangements necessary for a better function of the wetland, but also to establish the rules for grazing and fishing activities in the area and it' surroundings.

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Table 1 - Bird species recorded in Ciobarciu wetland's perimeter (2007 - 2008)

No.	Species' name	Birds' effectives			Birds' Directive Annexe 1	Romanian Red List
		Breeding pairs	Winter (individuals)	Migration (individuals)		
1.	Perdix perdix	4 - 7	14 – 20	40- 50		
2.	Coturnix coturnix	4 - 6		80 – 120		
3.	Cygnus olor	-	10 – 20	26 – 32		
4.	Anser anser	-	5 – 10	320 - 550		
5.	Anser albifrons	-	100 – 120	400 - 450	+	
6.	Anas platyrhynchos	1 – 2	60 – 120	235 - 420		
7.	Anas strepera	-		28 – 34		
8.	Anas penelope	-		18 – 32		
9.	Anas crecca	-	50 – 75	120 – 210		
10.	Anas querquedula	2 – 4		36 – 42		
11.	Anas clypeata	-		14 – 16		
12.	Aythya fuligula	-		24 – 32		
13.	Aythya farina	-		120 - 150		
14.	Aythya nyroca	1 – 2		40 – 60	+	Vu
15.	Dendrocopos syriacus	2 – 4			+	
16.	Upupa epops	2 – 3				Vu
17.	Alcedo atthis	1 - 2			+	
18.	Merops apiaster	15 – 20				
19.	Cuculus canorus	5 – 10				
20.	Athene noctua	1				
21.	Columba palumbus	-				
22.	Streptopelia decaocto	5 – 8				
23.	Streptopelia turtur	5 – 6				Vu
24.	Crex crex	2 - 4				Vu
25.	Gallinula chloropus	4 – 6				

26.	Fulica atra	8 – 10		300 – 450		
27.	Gallinago gallinago	-		2 – 4		
28.	Lymnocryptes minimus	-		45 – 50		
29.	Calidris alpina	-		35 – 50		
30.	Calidris ferruginea	-		120 – 140		
31.	Limicola falcinellus	-		35 – 40		
32.	Numenius arquata	-		80 – 120		
33.	Limosa limosa	2 – 3?		350 - 500		
34.	Tringa ochropus	-		20 – 45		
35.	Tringa glareola	-		75 – 90	+	
36.	Tringa nebularia	-		12 – 18		
37.	Tringa stagnatilis	-		10 – 14		
38.	Tringa totanus	-		120 – 150		
39.	Tringa erythropus	-		60 – 80		
40.	Arenaria interpres	-		5 – 10		
41.	Philomachus pugnax	-		330 – 600	+	
42.	Himantopus himantopus	1 – 2?		50 – 60	+	Th
43.	Vanellus vanellus	20 – 23		500 – 700		
44.	Charadrius dubius	1 – 2?		12 – 18		
45.	Larus ridibundus	8 – 10		160 – 200		
46.	Larus cachinnans	2 – 4		50 – 60		
47.	Sterna hirundo	8 – 10		24 – 38	+	
48.	Chlidonias hybridus	18 - 30		120 – 150	+	
49.	Chlidonias niger	3 – 5?		10 – 16	+	
50.	Aquila clanga	-		1 – 3	+	Cr-th
51.	Aquila pomarina	1?		3 – 5		Vu
52.	Aquila heliaca	-		2 – 4	+	Cr-th
53.	Circaetus gallicus	-	-	3 – 5	+	Vu
54.	Buteo buteo	2	4	18 – 22		

55.	Pernis apivorus	1		10 – 18	+	Vu
56.	Circus aeruginosus	1			+	
57.	Falco tinnunculus	1 – 2				
58.	Podiceps cristatus	2 – 3		18 - 22		
59.	Tachybaptus ruficollis	2 – 3		14 – 16	+	
60.	Phalacrocorax carbo	-		60 – 80		
61.	Egretta garzetta	-		20 – 30	+	Th
62.	Ardea cinerea	1 – 2	2 - 4	40 – 55		
63.	Ardea purpurea	1?		10 – 12	+	Th
64.	Ardea alba/Casmerodius albus	-	3 - 6	25 – 38	+	Th
65.	Ardeola ralloides	2 – 3		12 – 16	+	Vu
66.	Nycticorax nycticorax	1 – 2		24 – 40	+	Vu
67.	Ixobrychus minutus	1 – 2		8 – 10	+	
68.	Botaurus stellaris	1?		2 males	+	
69.	Platalea leucorodia	-		18 – 32	+	Th
70.	Ciconia ciconia	8 – 10		230 – 500	+	Vu
71.	Ciconia nigra	-		36 - 60	+	Vu
72.	Lanius collurio	8 – 10			+	
73.	Lanius minor	6 – 8			+	
74.	Corvus frugilegus	-				
75.	Corvus corone cornix	4 – 6				
76.	Corvus corax	1 – 2				Th
77.	Pica pica	3 – 4				
78.	Oriolus oriolus	2 – 4				
79.	Saxicola rubetra	5 – 7				
80.	Saxicola torquata	3 – 4				
81.	Sturnus vulgaris	40 – 50				
82.	Troglodytes troglodytes	-				
83.	Parus major	15 – 20				

84.	Parus coeruleus	6 – 8				
85.	Hirundo rustica	60 – 80				
86.	Riparia riparia	35 – 40				
87.	Delichon urbica	60 – 70				
88.	Cettia cetti	-				
89.	Locustella luscinioides	-				
90.	Acrocephalus arundinaceus	15 – 20				
91.	Acrocephalus scirpaceus	20 – 25				
92.	Acrocephalus schoenobaenus	10 – 15				
93.	Panurus biarmicus	8 - 10				
94.	Alauda arvensis	15 – 20				
95.	Galerida cristatus	10 – 12				
96.	Passer domesticus	120 – 140				
97.	Passer montanus	30 - 40				
98.	Motacilla alba	2 – 4				
99.	Motacilla flava	5 – 8				
100.	Anthus campestris	3 – 4			+	
101.	Carduelis chloris	12 – 14				
102.	Carduelis carduelis	20 – 25				
103.	Carduelis cannabina	2 - 4				
104.	Miliaria calandra	8 - 10				
105.	Emberiza schoeniclus	15 - 17				

Legend: Vu – vulnerable species; Th – threatened species; Cr-th – critically threatened species.