

Spring migration of waders in the Razim–Sinoie lagoon system south of the Danube delta, Romania

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Spring migration patterns and waterfowl numbers were surveyed from 1990–96 in the Razim–Sinoie lagoon system south of the Danube delta, Romania. Population estimates of all waders recorded are presented. For the more common species, the phenology is shown by counts in each ten day–period from end of March to the end of May. Maximum numbers are given for the less common or even rare species. A total of 40 wader species were recorded in all. Curlew Sandpiper *Calidris ferruginea*, Dunlin *Calidris alpina*, Ruff *Philomachus pugnax* and Black–tailed Godwit *Limosa limosa* were the most numerous. The Razim–Sinoie lagoon system is one of the major sites for migrating waders in eastern Europe, with up to 50,000 birds in spring. The lagoon system and the Danube delta also have great importance for breeding and wintering birds. Efforts to protect these unique wetlands urgently need to be strengthened.

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INTRODUCTION

The Danube Delta at the western coast of the Black Sea is one of the largest deltas in Europe, covering a total area of 550,000 ha, over 450,000 ha being in Romania, the rest in Ukraine.

The whole delta, the world's largest reed–covered area, consists of a variety of small to medium sized lakes, vast areas with swamp vegetation and reed, woods with willow and poplar trees, oak forests and, of course, the branches of the river Danube. The area in Ukraine, the mouth of Bratul Chilia, is currently the only actively expanding part of the system with a high rate of sedimentation.

The delta was declared a Biosphere Reserve in 1990, and a Ramsar site in 1991. Over half of its area was also placed on the World Heritage List in 1991. At certain times of the year the majority of the world population of Red–breasted Goose *Branta ruficollis* and Pygmy Cormorant *Phalacrocorax pygmeus* is to be found in the delta. Furthermore, it is of great importance for pelicans, with half the Palearctic breeding population of White Pelican *Pelecanus onocrotalus* and 5% of the world breeding population of Dalmatian Pelican *Pelecanus crispus* (Green 1992). 327 bird species have been recorded, including about 170 breeding species (Weber, pers. comm.).

The Razim–Sinoie lagoon system is situated in the south of the delta (Figure 1). Lakes Razim, Golovita, Zmeica and Sinoie are large and brackish with vast shallow sections and reed beds and are surrounded by some smaller lakes of the same type. They are protected from the sea by sand bars

which formerly had gaps in them, allowing the penetration of sea water. The lakes, with an area of 90,000 ha, are separated by sand dunes, sand islands and bars. Their water level depends on two factors, climatic conditions and fresh water input from the Danube, and is quite variable. Especially strong winds can create large open mudflats which are suitable habitats for waders. Sacalin Island, a sedimentary spit in the Black Sea near the mouth of Bratul Sfintu Gheorghe, a branch of the Danube, is also important for migrating waders.

Despite the popularity of the Danube Delta among European ornithologists, little information on wader numbers using the Razim–Sinoie lagoon complex as a stop–over site on spring migration has been published (Harenger *et al.* 1991; Brehme *et al.* 1992). In order to close this gap in our knowledge, the Biologische Station 'Rieselfelder Münster' – in co–operation with the Societatea Ornitologica Romana and the Danube Delta Research and Design Institute – has organised annual spring surveys of waders and waterfowl since 1990.

METHODS

Seven expeditions were carried out during the following periods: 3–8 April 1990, 26–30 March 1991, 8–15 April 1992, 1–27 April 1993, 23 March to 16 May 1994, 25 March to 23 May 1995 and 29 March to 4 June 1996.

The lagoon system was divided into different counting areas covering Lakes Sinoie, Zmeica, Istria and Nuntasi almost completely (Figure 2). Divisions were made according to

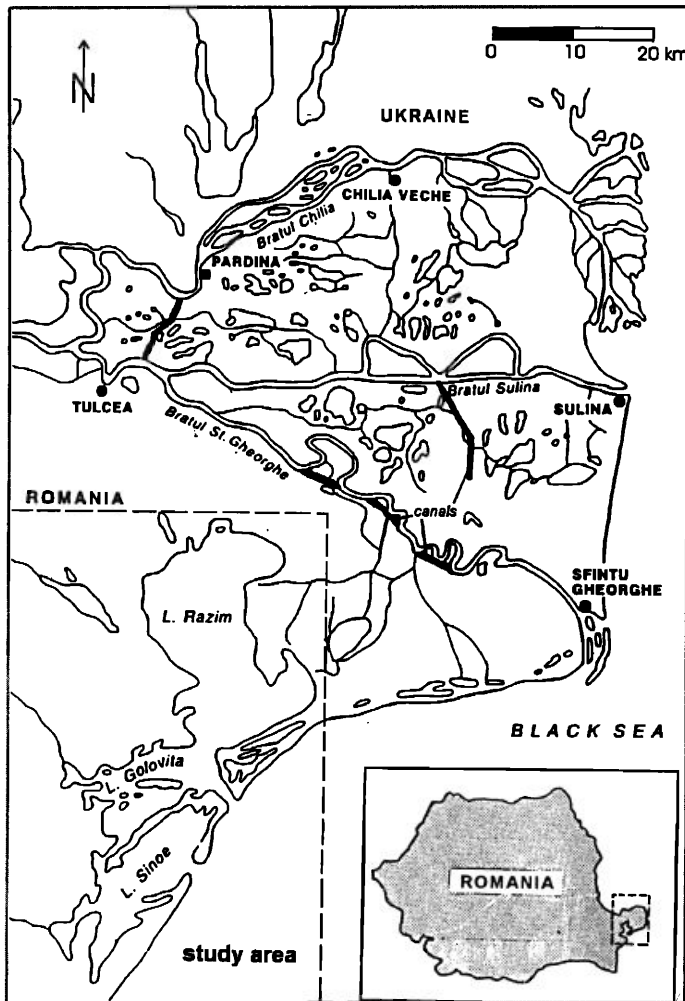


Figure 1. Location of the Danube Delta and the Razim–Sinoie lagoon system (Pons 1992, modified).

habitat and were of a size that could be censused in not more than a day. Additionally, some sites at the northern and western sections of Lake Razim and at the northern section of Lake Golovita were involved. Other parts of the complex did not usually hold large numbers of waterbirds in spring, as shown by some earlier study trips, and were therefore not counted regularly. In 1993, 1994 and 1995 short visits to Sacalin island were made. The counting results obtained at Sacalin island were generally not included in the population estimates (Table 1 and 2), and only individual observations of special interest are mentioned in the text and Table 2.

In the lagoon system the counts were made by car or on foot, with up to five groups (2–3 persons) working at the same time in different counting areas. Despite this effort, it was not possible to make simultaneous surveys of the whole lagoon complex, but usually a complete survey was finished within 2–4 successive days. Interruptions during these counting periods were avoided, to prevent inaccuracy caused by changes in site utilization and distribution of birds. The census was repeated in every ten-day period. The surveys included roosting as well as local breeding birds. Double counts were excluded. Although counting activities were focussed on waders and waterbirds, all other observations were noted carefully.

Counting was sometimes difficult, because of the size and inaccessibility of some potentially important parts of the delta. Moreover, suitability of roosting sites depends on the water level, which is controlled by wind strength and direction. As a result the birds often change their roosting places. For these reasons, we estimated bird numbers very cautiously, and the estimates presented below reflect minimum numbers.

RESULTS AND DISCUSSION

A total of 40 wader species were observed, some in amazing numbers. The mean of counts carried out in each ten-day period between the end of March and end of May from 1990 and 1996 for the more common species are shown in Table 1. Variation in numbers between the years may be somewhat related to counting methods and techniques used for estimating the population-sizes (minimum numbers).

Curlew Sandpiper *Calidris ferruginea*, Dunlin *Calidris alpina*, Ruff *Philomachus pugnax* and Black-tailed Godwit *Limosa limosa* were the most numerous waders. Avocet *Recurvirostra avosetta*, Little Stint *Calidris minuta*, Redshank *Tringa totanus* and Wood Sandpiper *Tringa glareola* also reached or exceeded totals of 1,000. Table 2 gives an overview of the less common or even rare species recorded during the expeditions. As with the more frequent species, estimates are in some cases influenced by local breeding birds. Black-winged Pratincole *Glareola nordmanni*, a (former?) breeding bird in east Romania (Weber *et al.* 1994), was only seen on two occasions, an indication of its general decline in Ukraine and Romania (Tucker & Heath 1994). Greater Sand Plover *Charadrius leschenaultii* was a first record for Romania, as it is not mentioned in Munteanu (1992). The record of an Asiatic Plover *Charadrius asiaticus* in female plumage in May 1996 must be the third record for the country. The observations of Terek Sandpiper *Xenus cinereus* suggest that it is a scarce but regular passage migrant on the western Black Sea coast. We were not able to produce new records of the globally threatened Slender-billed Curlew *Numenius tenuirostris*, but the wetlands in Romania, especially the Danube Delta and the Razim–Sinoie lagoon, are still of great importance as key passage sites for the species. The latest sightings were in the Ukrainian part of the Danube Delta: single birds occurred in August 1994 and September and October 1996 (Zhmud 1997). An additional record to those given in Tables 1 and 2, was a large flock of about 1,350 Spotted Redshanks *Tringa erythropus* observed on Sacalin Island on 26 April 1993. This number is higher than any of the estimates for the whole Razim–Sinoie lagoon system.

Of particular note was a phenomenon observed in Ruff: In the last ten days of April 1993 a high percentage of the birds in the coastal lagoons were still in winter plumage (nearly 80–90 % of the males) while the majority of the 2,000–3,000 birds at an inland passage site (Sereth valley near Independenta) 90 km from the lagoons was in breeding plumage (60–70 % of the males). A similar observation was made on 1 May 1994. Of

Table 1. Mean spring counts of common wader species in the Razim–Sinoie lagoon complex in the period 1990–96. I–III = decades; * = influenced by local breeding population.

SPECIES	MARCH	APRIL			MAY		
	III (n=4)	I (n=6)	II (n=4)	III (n=3)	I (n=3)	II (n=2)	III (n=2)
<i>Haematopus ostralegus</i>	500	486	195	193	40	40	30
<i>Himantopus himantopus</i>	10	60	117	137	280	230	325
<i>Recurvirostra avosetta</i>	875	750	488	267	223	200	150
<i>Glareola pratincola</i>	0	0	35	30	87	115	195
<i>Charadrius alexandrinus</i>	212	283	200	267	267	425	375
<i>Vanellus vanellus</i>	292	177	133	107	163	210	200
<i>Calidris alba</i>	56	50	12	20	145	40	10
<i>Calidris minuta</i>	118	14	160	390	2333	2300	1700
<i>Calidris ferruginea</i>	3	12	18	56	2233	4800	4575
<i>Calidris alpina</i>	2725	6017	1950	1267	983	400	255
<i>Limicola falcinellus</i>	0	0	0	0	2	250	140
<i>Philomachus pugnax</i>	4725	7917	7250	5683	1433	125	175
<i>Limosa limosa</i>	9075	5567	888	373	35	20	40
<i>Numenius arquata</i>	190	160	43	47	23	40	55
<i>Tringa erythropus</i>	93	242	300	453	443	140	5
<i>Tringa totanus</i>	1533	541	205	150	90	100	65
<i>Tringa stagnatilis</i>	145	373	378	223	10	0	0
<i>Tringa ochropus</i>	85	45	18	13	10	0	0
<i>Tringa glareola</i>	24	81	458	660	850	150	40
<i>Arenaria interpres</i>	0	0	0	0	50	230	150

Table 2. Maximum spring totals of waders in the Razim–Sinoie lagoon system (except those included in Table 1) in the period 1990–96. I–III = decades; * = influenced by local breeding population.

SPECIES	MAXIMUM	COMMENT
<i>Burhinus oedicephalus</i> *	20	breeding birds
<i>Glareola nordmanni</i>	1 (9 May 1994, 7 April 1996)	only two observations
<i>Charadrius dubius</i> *	50 (I April 1993, III March 1996)	
<i>Charadrius hiaticula</i>	40 (I, III May 1995; I May 1996)	
<i>Charadrius leschenaultii</i>	1 (27, 28 May and 2 June 1996)	male in breeding plumage; confirmed by the Association of European Rarities Committees
<i>Charadrius asiaticus</i>	1 (26 May 1996)	female plumage; confirmed by the Association of European Rarities Committees
<i>Charadrius morinellus</i>	15 (3–4 April 1990)	4 observations
<i>Pluvialis apricaria</i>	40 (29 March 1996)	<20 observations
<i>Pluvialis squatarola</i>	70 (I May 1995)	
<i>Calidris temminckii</i>	50 (I May 1996)	
<i>Lymnocyptes minimus</i>	8 (4 April 1995)	some observations of single birds
<i>Gallinago gallinago</i>	estimate: 1,000	largest concentration: 435 (400 on 2.5 ha)
<i>Gallinago media</i>	1	8 observations of single birds
<i>Scolopax rusticola</i>	1	2 observations of single birds in nearby forests
<i>Limosa lapponica</i>	3 (9 April 1996)	only 3 observations
<i>Numenius phaeopus</i>	70 (I April 1992)	
<i>Tringa nebularia</i>	80 (II April 1996)	
<i>Xenus cinereus</i>	2 (26 April 1993)	on Sacalin island; 5 observations in all
<i>Actitis hypoleucos</i>	30 (II April 1994)	
<i>Phalaropus lobatus</i>	35 (22 May 1995)	

I–III = decades; * = influenced by local breeding population

the 630 Ruffs roosting at a pond near Enisala (25 km from the coast, near the southern end of Lake Babadag, see Figure 1), 90% were in breeding plumage, while this proportion was on average 10–20% at the lagoon complex. These findings seem to suggest that there are two different populations migrating through east Romania, possibly both originating from the western African winter quarters (cf. van Rhijn 1991).

Figure 2 shows the distribution of Dunlin, Ruff and Black-tailed Godwit in the study area in 1994. The dots refer

to average numbers of the main migration period. The figure shows that waders prefer the southern part of Lake Sinoie and its surroundings, Lake Istria and Grindul Chituk, Grindul Saele and Grindul Lupilor that separate the lakes. This distribution pattern is mainly caused by these sites' large areas of shallow water, which are more restricted at Lakes Razim, Golovita and Zmeica. Furthermore, grazed steppe areas with temporary waters, another type of habitat suitable for waders, are chiefly to be found on the Grinduls.

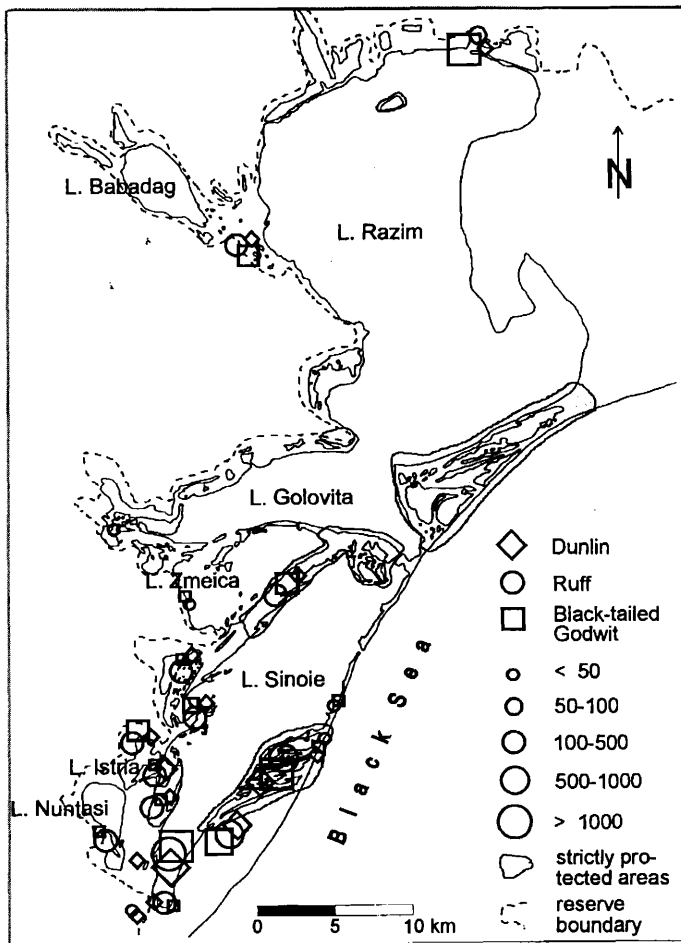


Figure 2. Distribution of Dunlin *Calidris alpina*, Ruff *Philomachus pugnax* and Black-tailed Godwit *Limosa limosa* in the Razim-Sinoie lagoon system in the spring 1994 (average numbers).

The results of our study fit in well with the occurrence of waders in Bulgaria during spring migration (Nankinov *et al.* 1996). However, Black-tailed Godwit only exceptionally occurs in such large flocks in Bulgaria (cf. Nankinov 1989), while Broad-billed Sandpiper *Limicola falcinellus* seems to be less frequent there.

Comparing our results to spring migration patterns and numbers of waders at the Sivash lagoons, located 350 km further east (van der Winden *et al.* 1993), which cover a total area of 2,500 km², some differences are worth mentioning. First, the occurrence of larger numbers of Broad-billed Sandpiper and Red-necked Phalarope *Phalaropus lobatus* at Sivash (population estimates in spring 1992: 6,000–8,000 and 1,000–2,000 respectively), probably due to the more easterly location of these wetlands. Second, the fact that Black-tailed Godwit and Wood Sandpiper are less numerous at Sivash (population estimates in spring 1992: 1,000–2,000 and 500–2,000 respectively) despite the much larger size of the lagoons. And third, the nearly complete absence of Ringed Plovers *Charadrius hiaticula*, Grey Plovers *Pluvialis squatarola* and Bar-tailed Godwits *Limosa lapponica* in the Razim-Sinoie lagoon system. These species are common in spring at Sivash with population estimates of 2,000–4,000 Ringed Plovers, 3,500–5,000 Grey Plovers and 2,000–5,000

Bar-tailed Godwits in 1992. It seems unlikely that the relatively short distance of 350 km between the Danube Delta and Sivash should alone be responsible for the outlined differences. Therefore, we suggest that habitat differences are possibly the reason. Black-tailed Godwit and Wood Sandpiper are rather freshwater species, while Ringed Plover, Grey Plover and Bar-tailed Godwit are more or less confined to saline or brackish habitats (Cramp 1983). A higher degree of salinity at Sivash, which consists of brackish to hypersaline lagoons (van der Have & van der Winden 1993), might be the explanation for the differences in the wader communities.

CONCLUSIONS

The Razim-Sinoie lagoon system is the most important wetland for migrating waders in Romania and one of the major sites in eastern Europe. Up to 50,000 waders occur in spring, accompanied by more than 20,000 dabbling ducks (unpubl. data). Weber (1998) gives even higher numbers, taking all seasons into account. The populations of several species reach or exceed the 1% level, implementing Ramsar Convention criterion 3c (cf. Rose & Scott 1997). The lagoon complex and the delta also have great importance for breeding and wintering birds (Rose 1992; Rose & Taylor 1993), although huge parts, especially of the delta itself, were destroyed or damaged beyond repair by the end of the 1980s. Several interrelated factors led to a deterioration of water quality and damage to the functioning of the Danube delta. Pinay (1992) mentions the high nutrient loads of the Danube river upstream of the delta, engineering impoundments (dykes, canalization), other human activities such as intensive agriculture, forestry and fisheries, and changes in the hydraulic regime of the Danube river. Large areas were drained in the post-war period. The lagoon system experienced habitat degradation to a somewhat lesser degree, but the closing of the communications between the basins and the sea has produced a decrease in water salinity (Wilson & Moser 1994).

The delta and the Razim-Sinoie lagoon system are protected by Decret Nr. 283 of the Romanian government: "The legislation for the establishment of the Danube Delta Biosphere Reserve". The territory is divided into strictly protected areas, buffer zones in which certain human activities are permitted, and transition or economic zones with ecological reconstruction measures in which traditional economic activities are permitted (see Figure 3 for the delimitation of the different zones in the lagoon complex). The whole reserve is supervised by wardens.

Our results suggest that the extent and delimitation of the different zones of the Biosphere Reserve is not currently adequate for the conservation of the most important areas for waders within the lagoon system. Many very important parts only have the status of buffer zones, such as the southern bight of Lake Sinoie, or are situated directly on the border of the reserve. Both the strictly protected areas and the boundaries

of the whole reserve therefore need to be expanded. Similar demands have already been made by Weber (1998). Moreover, better supervision and enforcement of the protective statutes of the Biosphere Reserve and strengthening of the warden's activities are needed. Yet one gets the impression that politicians and business men in the region are blocking all efforts to improve the protection of the area, in order to push economic exploitation. Besides these fundamental problems, other threats to the lagoon system include intensive cattle grazing (resulting in heavy disturbances of ground-breeding birds), intentional or accidental reed burning, poaching, and uncontrolled hunting. At the Grindul Chituc, one of the most sensitive areas of the lagoons, separating the southern bight of Lake Sinoie from the sea, mining has been delayed until now. The duneland is covered with pieces of scrap metal and other bits of equipment, presumably from the extraction machinery. Other threats, which apply not only to Grindul Chituc, are planned or built aerial power lines, and in the salt meadow complex near Vadu, located at the south end of Lake Sinoie, heavy pollution of the soil and ground water has occurred, due to several used-oil basins which are in a poor state of repair. This is an especially important area for waders and waterfowl.

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REFERENCES

- Brehme, S., Müller, T. & Redlich, J. 1992. *Bird observations in the Danube Delta and in the Dobrogea (Romania)*. WIWO-report 43, WIWO, Zeist, The Netherlands.
- Cramp, S. (ed.) 1983. *Handbook of the Birds of Europe, the Middle East and North Africa: the Birds of the Western Palearctic, Vol. 3, Waders to Gulls*. Oxford, UK.
- Green, R. 1992. *The ornithological importance of the Danube Delta and lakes Razim-Sinoie*. In: IUCN EEP Environmental Status Reports, Vol. 4: Conservation Status of the Danube Delta, pp. 61–70.
- Harenger, M., Melter, J. & Reinke, E. 1991. Ornithological observations in Romania during April 1990. *Wader Study Group Bull.* 62: 37–38.
- Munteanu, D. 1992. *Dictionar Poliglot Al Speciilor De Pasari Din Romania*. Publ. S.O.R. 1, Medias, Romania. (In Romanian).
- Nankinov, D. 1989. The status of waders in Bulgaria. *Wader Study Group Bull.* 56: 16–25.
- Nankinov, D. et al. 1996. A census of migrating waders in Bulgaria during March–May 1990. *Wader Study Group Bull.* 83: 37–43.
- Pinay, G. 1992. *Trophic status of the Danube delta: a water quality assessment*. In: IUCN EEP Environmental Status Reports, Vol. 4: Conservation Status of the Danube Delta, pp. 55–60.
- Pons, L. J. 1992. *Natural resources*. In: IUCN EEP Environmental Status Reports, Vol. 4: Conservation Status of the Danube Delta, pp. 23–36.
- Rose, P. M. 1992. *Western Palearctic Waterfowl Census 1992*. IWRB, Slimbridge, U. K.
- Rose, P. M. & Scott, D. A. 1997. *Waterfowl Population Estimates – Second Edition*. Wetlands International Publ. 44. Wageningen, The Netherlands.
- Rose, P. M. & Taylor, V. 1993. *Western Palearctic and South West Asia Waterfowl Census 1993*. IWRB, Slimbridge, U. K.
- Tucker, G. M. & Heath, M. F. 1994. *Birds in Europe: their conservation status*. BirdLife Conservation Series No. 3. Cambridge, U. K.
- van der Have, T. & van der Winden, J. 1993. The Sivash lagoon system. In: van der Have, T. M., van de Sant, S., Verkuil, Y. & van der Winden, J. (eds.). *Waterbirds in the Sivash, Ukraine, spring 1992*. WIWO-report 36, pp. 5–6. WIWO, Zeist, The Netherlands.
- van Rhijn, J.G. 1991. *The Ruff: individuality in a gregarious wading bird*. T. & A. D. Poyser, London, U. K.
- van der Winden, J., van der Have, T. M., Stikvoort, E. & Zwinselman, B. 1993. Numbers of waterbirds in the Sivash, Ukraine, spring 1992. In: van der Have, T. M., van de Sant, S., Verkuil, Y. & van der Winden, J. (eds.). *Waterbirds in the Sivash, Ukraine, spring 1992*. WIWO-report 36, pp. 7–32. WIWO, Zeist, The Netherlands.

Weber, P. 1998. *Avifaunistisch-ökologische Untersuchung des Vogelschutzgebietes Histria*. PhD thesis, summary. Cluj, Romania. (In German).

Weber, P., Munteanu, D. & Papadopol, A. 1994. *Atlasul Provizoriu Al Pasarilor Clocitoare Din Romana*. Publ. S.O.R. 2, Medias, Romania. (In Romanian/German).

Wilson, A.M. & Moser, M.E. 1994. *Conservation of Black Sea Wetlands: a review and preliminary action plan*. IWRB Publ. 33. Oxford, UK.

Zhmud, M. E. 1997. Records of Slender-billed Curlew, *Numenius tenuirostris*, in the Ukrainian part of the Danube delta. *Information Materials of the Working Group on Waders* 10: 41-42.