WADERS OF RESERVOIRS IN SOUTH-WESTERN POLAND

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This paper presents the preliminary results of investigations on wader migrations through two large reservoirs in Poland. Until now sites of large wader concentrations have not been known in the Polish interior, and systematic observations have only been undertaken on the Baltic coast near the Vistula mouth. The lack of this kind of investigation has contributed to misguided opinions on the intensity of the passage of many wader species through the country's interior. The data collected correct these opinion and indicates the great importance of both reservoirs for migrating waders.

Area description

Nysa and Turawa Reservoirs are situated 80 km apart in south-western Poland, 400-450 km from the Baltic coast (Fig.1). They are similar in size - about 2000 ha. Nysa Reservoir lies among hills and surrounded with fields and meadows, at the foot of the Opawskie Mountains. Turawa Reservoir is situated in lowland surrounded mainly with forests. Nysa Reservoir was constructed in 1972, Turawa Reservoir in 1948. Common to both are great fluctuations in water level. In spring the level is high, in summer and autumn 3-4m lower, disclosing large areas of the bottom. The waterline of the Nysa Reservoir is more diverse with many bays, islets and shallows. The bottom is very muddy, though parts of the shore are shingly. The bottom of Turawa Reservoir is less muddy and many parts of the shore constitute sandy beaches.

Methods

Investigations have been carried out since 1976: 210 visits have been made to Nysa Reservoir and 150 to Turawa Reservoir. The observations were made throughout the year, particularly often in summer and autumn, when the reservoirs were checked at 3-7 day intervals. Each time all the waders were counted on the whole reservoir. In order to ascertain the habitat selection of different species, the birds were counted in separate zones of the shoreline. These zones differ in the nature of their ground, and in the diversity of shoreline. In addition, in August 1978 and 79 daily counts of waders in Nysa Reservoir were carried out, accompanied by trapping. The birds were ringed and dyed in order to find out the length of the period of their stay on the reservoir.

Results

Both reservoirs were intensively used by waders only in the autumn migration period. During the whole period of investigations the passage of waders was intensive only in three years: 1976, 1978, 1979. In the remaining two years passage was sparse, probably due to the high water-levels or annual fluctuations of the migration patterns. In total 39 wader species have been found at the reservoirs (Table 1). The most numerous species in all the months (except December) proved to be the Lapwing Vanellus vanellus. The passage numbers of this species show strong fluctuations and do not present any clear patterns. In July and August the dominant species were the Ruff Philomachus pugnax, Wood Sandpiper Tringa glareola and Common Sandpiper Actitis hypoleucos; the peaks of their numbers fall in the first half of August.

The passage of Common Sandpiper was very intensive with the maximal concentrations comprising 434 birds on Nysa Reservoir and 210 birds on Turawa Reservoir. In autumn the most numerous species on the reservoirs, apart from Lapwing, was Dunlin Calidris alpina (up to 800 birds in October). Little Stint Calidris minuta and Curlew Sandpiper Calidris ferruginea stop there regularly, though the number of these birds varies considerably in particular years. A remarkably strong Little Stint passage was recorded in the middle of September 1978, when maxima of 505 birds on Nysa Reservoir and 407 on Turawa Reservoir were noticed. Nysa Reservoir is only place in Poland known for numerous and regular occurence of the Curlew Numenius arquata (80 - 100 birds). They always stay on the reservoir from the end of June till the beginning of December, and moult there; this is proved by their feathers often found at the place.

The observations on both reservoirs showed that some species, previously believed to occur rarely inland, pass the reservoirs regularly, though not in large numbers. This concerns: Turnstone Arenaria interpres (max. 7 - Nysa), Sanderling Calidris alba (max. 48 - Turawa), Knot Calidris canutus (max. 21 - Nysa), Broad-billed Sandpiper Limicola falcinellus (max. 19 - Turawa), Bar-tailed Godwit Limosa limosa (max. 64 - Nysa), Whimbrel Numenius phaeopus (max. 43 - Nysa), Red-necked Phalarope Phalaropus lobatus (max. 4 - Turawa).

A comparison of quantitative and qualitative composition of wader aggregations on both reservoirs shows some distinct differences in spite of their proximity and similarity in size. On Nysa Reservoir 36 species were found with maximum numbers in one day reaching 5-6,000 birds; while on Turawa Reservoir 31 species were observed with a maximum of 1-1,500 birds. Most species clearly occur in larger numbers on Nysa Reservoir (Table 2). The difference is especially outstanding in the case of Lapwing and Curlew. The main reason of this seems to be the difference in the quality of the bottom. The Turawa Reservoir is less muddy, and more sandy, while the bottom of Nysa Reservoir is very muddy. Examinations of bottom samples taken from very muddy places in Nysa Reservoir show that the organisms serving as a food for waders (Chironomidae and Oligochaeta larvae) occur in densities up to 42,000 individuals/m^2, yet the samples taken from more sandy places show the concentration of these invertebrates of only 3,000 individuals/m^2. Places of the latter kind, sparse on Nysa Reservoir, are particularly characteristic for Turawa Reservoir. Factors such as the diversity of the shoreline, various shore shapes, the situation of the reservoir and its age can have some influence on this attractiveness as well. The higher attractiveness of Nysa Reservoir for waders is reflected in the length of the birds' stays. In order to examine this birds were caught and marked with a different colour combinations applied for each day of capture. Subsequently every day observations on the reservoir were carried out to record presence of marked individuals. The material collected for 172 Wood Sandpipers makes it possible to state that some of these birds stay there up to 3 weeks (Fig.2). The information obtained from birds caught twice shows that the majority of them increase their body weight distinctly (max. 19 g during 9 days).

The investigations carried out simultanously on two reservoirs demonstrate that any conclusions based on the observations undertaken only at one place, even a very convenient one for waders, can lead to a erroneous generalisations resulting from the specific features of the given reservoir.

That is why the establishment of the Inland Wader Counts by WSG is very valuable. Both reservoirs described in this paper have been included into this project.

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Table 1. Maximum number of each waders species observed in any one day at Nysa Reservoir in autumn 1976-80

	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Oystercatcher *Haematopus ostralegus*		1	1	1	2		
Ringed Plover *Charadrius hiaticula*	3	4	23	53	24		
Little Ringed Plover *Charadrius dubius*	17	57	41	29	1		
Golden Plover *Pluvialis apricaria*			9	4	73	138	
Lesser Golden Plover *Pluvialis dominica*						1	
Grey Plover *Pluvialis squatarola*		1	10	98	121	120	
Lapwing *Vanellus vanellus*	626	2055	1950	4750	2800	1720	25
Sociable Plover *Chettusia gregaria*					1		
Turnstone *Arenaria interpres*			7	2			
Little Stint *Calidris minuta*		11	24	505	39		
Temminck's Stint *Calidris temminickii*		3	10	4			
Dunlin *Calidris alpina*		7	18	519	795	572	
Curlew Sandpiper *Calidris ferruginea*		5	114	106	13		
Baird's Sandpiper *Calidris bairdii*			1				
Knot *Calidris canutus*			11	21	7		
Sanderling *Calidris alba*		1	5	18	8		
Buff-breasted Sandpiper *Tryngites subruficollis*				1			
Broad-billed Sandpiper *Limicola falcinellus*			4	4			
Ruff *Philomachus pugnax*	43	521	622	125	85	10	1
Spotted Redshank *Tringa erythropus*	4	5	54	52	14		
Redshank *Tringa totanus*	30	14	21	6	1		
Greenshank *Tringa nebularia*	12	84	130	75	6	1	
Marsh Sandpiper *Tringa stagnatilis*			5				
Green Sandpiper *Tringa ochropus*	21	13	27	9	3	2	1
Wood Sandpiper *Tringa glareola*	59	277	480	101	5	1	
Common Sandpiper *Actitis hypoleucos*	3	261	434	23	1		
Bar-tailed Godwit *Limosa limosa*				64	3		
Black-tailed Godwit *Limosa lapponica*	3	30	34	4	2	1	
Curlew *Numenius arquata*	32	112	143	104	160	96	49
Slender-billed Curlew *Numenius tenuirostris*			1				
Whimbrel *Numenius phaeopus*	30	6	43	3	1		
Snipe *Gallinago gallinago*		87	373	149	114	40	
Avocet *Recurvirostra avosetta*				1			
Red-necked Phalarope *Phalaropus lobatus*		1	2	2			
Grey Phalarope *Phalaropus fulicarius*					1		
Stone Curlew *Burhinus oedicnemus*			1				

Table 2. Maximum numbers of fifteen wader species observed in any one day at Nysa and Turawa reservoirs in autumn migration in years 1976-80

	Nysa	Turawa
Lapwing *Vanellus vanellus*	4750	640
Dunlin *Calidris alpina*	795	409
Ruff *Philomachus pugnax*	622	156
Little Stint *Calidris minuta*	505	407
Wood Sandpiper *Tringa glareola*	480	355
Common Sandpiper *Actitis hypoleucos*	434	210
Snipe *Gallinago gallinago*	373	197
Curlew *Numenius arquata*	160	25
Golden Plover *Pluvialis apricaria*	138	250
Greenshank *Tringa nebularia*	130	122
Grey Plover *Pluvialis squatarola*	121	103
Curlew Sandpiper *Calidris ferruginea*	114	64
Bar-tailed Godwit *Limosa limosa*	64	4
Little Ringed Plover *Charadrius dubius*	57	29
Spotted Redshank *Tringa erythropus*	54	144

Figure 1. Location of reservoirs studied: 1 - Nysa, 2 - Turawa.

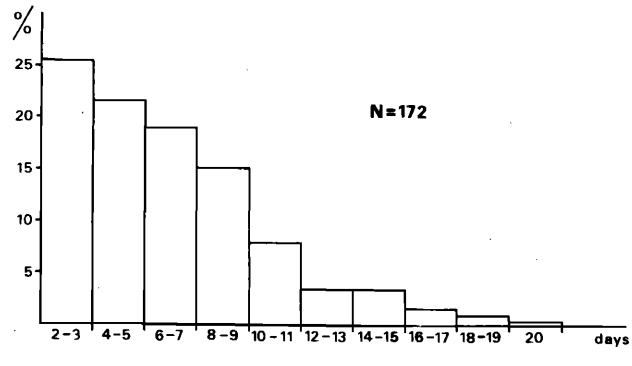

Figure 2. The length of stay of Wood Sandpipers on the Nysa Reservoir in August 1978-79.