

- 6) Dwingelose and Kraloer Heide, Netherlands; 1500ha of moorland with numerous ponds; number per count: 128.
- 7) Ochsenmoor, Dümmer, Lower Saxony; a part (some 100 ha) of a wet meadow area with only few wet places in August; number per count: 562.
- 8) Baggerweihergebiet Nennig-Besch and adjoining Moselle; some 125 ha of gravel pits with the adjoining bank of the River Moselle; number per count: 106.
- 9) Rheindelta am Bodensee; some 10 km² of different wetland habitats at the mouth of the river Rhine in Lake Constance; number per count: 872.
- 10) Rieselfelder Braunschweig, Lower Saxony; municipal sewage farms, size some 30 ha; number per count: 99.
- 11) Attigny, France; about 20 ha of clearing basins of a sugar-mill; number per count: 311.

The value of the diagram is limited because the data originate from only one migration period (1980) and because only relative and no absolute frequencies are indicated by the heights of the columns. Consequently a given species forming a high percentage of all registered waders at a small site might be much scarcer there than at a large resting site where this species forms a relative small part of all resting waders.

Nevertheless, some differences and similarities may be seen from the figures. The compositions of the wader communities at the coastal sites are distinctly different from those of the inland sites. Apart from the Curlew *Numenius arquata* no species dominant at the coast occurs at inland sites in relative frequencies worth mentioning and vice versa.

The relative frequencies of wader species at the three "sewage-sites" Attigny (11), Braunschweig (10) and Salzgitter-Heerte (4) were similar: Lapwings were most numerous and the proportions of *Tringa* sandpipers were quite high, too. The species diversities were lowest at the gravelpit site (8) and at the wet meadow site (7) (which is dry in August); at both sites more than 90% of the counted waders were Lapwings.

These results, too, have to be supported by continuing the studies in future years.

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ADDENDUM

Count sites in Great Britain are: Threipmuir Res. (Midlothian); Wath Ings (Yorks) Cobbinshaw Res. (Midlothian); Crosswood Reservoir (Midlothian); Harperrig Reservoir (Midlothian); West Water Reservoir (Peebleshire); Gladhouse Res. (Midlothian); Stanford Reservoir (Leicestershire/Northants boundary); Abberton Reservoir (Essex); Minsmere (Suffolk); Blithfield Reservoir (Staffordshire); Alvecote Pools Nature Reserve (Warwickshire/Staffordshire); Fairburn Ings (N.+W. Yorkshire); Belvide Res. (Staffordshire) and Upper and Lower Bittell Reservoirs (Worcs).

RESULTS OF TWENTY YEARS OF WADER RINGING AT THE MOUTH OF VISTULA IN POLAND

by J. Gromadzka

The area of the mouth of Vistula was, for many years and until quite recently, the only place in Poland where regular wader ringing was carried out. In the last few years the ringing of these birds has started in some other places (see WSG Bulletin 31).

The area at the mouth of Vistula was and still is one of rare places along Polish Baltic coast where large numbers of wader concentrate during autumn. It should be remembered that along non-tidal Polish coast there are no wide flat areas as suitable for waders as e.g. the Waddenze and some British estuaries. The maximum counts made during autumn at the mouth of Vistula have shown ca 1000 waders at one time (Dunlins *Calidris alpina* and Grey Plovers *Pluvialis squatarola* in the middle of October 1978).

The first wader catching in this area was started in 1960 by students of Warsaw Biological Club - initiators of Operation Baltic, the organization carrying out research on migrating birds (mainly passerines) along the Baltic coast. In years 1964-1967 the ringing was organized by the Ornithological Station of Gdansk, in years 1969-1975 by Operation Baltic, and since 1976 again by Ornithological Station.

In the past the area around the mouth has changed very much. In the 1960s at the right side of the mouth there were sandy islands and peninsula, changing their size and site, sometimes joining into a spit and finally forming a permanent connection with the mainland, giving rise to a lake. After some time the water in the lake has become fresh and the lake shore has been covered gradually with vegetation. At the left side of the mouth the similar changes have been observed. Now there are very wide sandy flats of variable sizes and big bird numbers have gathered there: during the breeding season, mainly terns; during the summer and autumn, gulls, terns, ducks, waders and others.

The right side of the mouth of Vistula near Mikoszewo (54.21 N, 18.57 E) appeared exceptionally suitable place for wader catching in traps during autumn migration. The traps were placed at first on the peninsula shore and next on the lake shore where relatively large wader numbers fed. In the 1970s the birds were caught each year in ca 20 traps (similar to those used in Ottenby Bird Observatory) placed along ca 2 km of sandy lake shore. The trapping was carried out from the beginning of or mid July to some time in September. The traps were checked each day, every second hour. In 1980 the catching was stopped in the end of July because of very low numbers of waders and because of a flood of the Vistula at the end of the month. It was the last year of wader catching in the right side of the mouth. The area has been covered with vegetation (willow, reed and other plants) so that it has lost its attractiveness for waders. The results of twenty years of wader catching at the mouth of the Vistula are shown in Table 1.

TABLE 1. Ringing and recovery totals 1960-1980 at the mouth of the Vistula, Poland.

	Ringed	Recovered (long-distance)	Foreign rings (controls)
Oystercatcher <i>Haematopus ostralegus</i>	3	-	-
Little Ringed Plover <i>Charadrius dubius</i>	410	8	-
Ringed Plover <i>C. hiaticula</i>	1075	62	4
Grey Plover <i>Pluvialis squatarola</i>	63	-	-
Lapwing <i>Vanellus vanellus</i>	2	-	-
Knot <i>Calidris canutus</i>	1061	29	2
Sanderling <i>C. alba</i>	59	-	-
Little Stint <i>C. minuta</i>	1680	31	9
Temminck's Stint <i>C. temminckii</i>	135	2	-
Curlew Sandpiper <i>C. ferruginea</i>	1139	15	6
Dunlin <i>C. alpina</i>	18118	372	160
Broad-billed Sandpiper <i>Limicola falcinellus</i>	60	-	-
Ruff <i>Philomachus pugnax</i>	483	11	-
Jack Snipe <i>Lymnocyptes minimus</i>	2	-	-
Common Snipe <i>Gallinago gallinago</i>	542	33	-
Black-tailed Godwit <i>Limosa limosa</i>	19	-	-
Bar-tailed Godwit <i>L. lapponica</i>	43	2	-
Curlew <i>Numenius arquata</i>	1	-	-
Whimbrel <i>N. phaeopus</i>	13	1	-
Spotted Redshank <i>Tringa erythropus</i>	31	3	-
Redshank <i>T. totanus</i>	769	31	2
Marsh Sandpiper <i>T. stagnatilis</i>	1	-	-
Greenshank <i>T. nebularia</i>	31	-	-
Green Sandpiper <i>T. ochropus</i>	18	-	-
Wood Sandpiper <i>T. glareola</i>	441	3	-
Common Sandpiper <i>T. hypoleucos</i>	2955	22	1
Terek Sandpiper <i>Xenus cinereus</i>	6	-	-
Turnstone <i>Arenaria interpres</i>	149	3	1
Red-necked Phalarope <i>Phalaropus lobatus</i>	51	-	-
Golden Plover <i>Pluvialis apricaria</i>	1	-	-
Total:	29361	628	186

Apart from wader catching, in almost every year catching of passerines in mist-nets in bushes and reed was also organized. Almost all birds (waders and passerines) were weighed and measured. Additionally in some years all waders on the lake shore and all water birds on the lake were counted (mostly three times a day) with telescope 20-40 x 80. The comparison of counting and trapping results has shown that, on average, 75% of all waders present at the lake shore had been caught in traps. But on the other hand it appeared that the results of catching and counting made on one side of the mouth have not made it possible to describe exactly the dynamics of wader migration through this area of Baltic. The numbers of birds observed have depended, among other things, on the weather conditions, water level etc; changes in numbers on the other side, 1-2 km away, have been quite different.

The large quantity of material gathered up to the present time has been shown in few publications only. All reports concerning the wader ringing at the mouth of the Vistula have been published in Polish in the *Notatki ornitologiczne*, the *Acta ornithologica* and, in English, in *The Ring*. Among the publications which should be mentioned the paper by Zajac (1980) about different autumn migration rates of sexes in the Dunlin; and also the publications currently in press: about wader numbers in the Gdansk Bay by Gromadzka and Gromadzki and about the results of Dunlin ringing in Poland by Gromadzka. In the near future the recoveries of the other *Calidris* species and Redshank *Tringa totanus* will also be published.

In the future the Ornithological Station is going to organize wader ringing at the left side of the Vistula mouth, where hundreds of feeding and resting waders have been observed every year. In those topographically different conditions from those of the lake shore on the right side of the mouth, mist-nets will be used; this method has not been widely used in Poland for wader catching up to now.

References

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