

**Habitat selection and feeding ecology of the Ringed Plover
(*Charadrius hiaticula*) and Little Ringed Plover (*Charadrius dubius*) in
Vistula River Valley during autumn migration**

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Research into the ecology of feeding ringed plover (*Charadrius hiaticula*) and little ringed plover (*Charadrius dubius*) was conducted at two research points. The first point was located in the Central Vistula Valley (Pawłowice point), the second was located in the Lower Vistula Valley (Lisewo Malborskie point). In the period July-September in 2006-2009 systematic observations of both species of plovers were carried out. For the first time, the results of observing the behavior of both species of plovers at the stopping places located outside the coasts are described. The research is also the first to compare the ecology of foraging of two closely related bird species on the regulated and unregulated stretch of the Vistula. During the research, a potential food base was determined on the basis of samples taken from the layer of exposed mud, wet sand and dry sand as well as from stone and concrete river regulation elements that occurred only in the area of the Lisewo Malborskie research point. The real food base was established using a viable method for acquiring stomach contents. Birds of both species preyed most often on muddy ground (in Pawłowice 51% of statements), (in Lisewo Malborskie 62%), wet sand (32% and 27% respectively), dry sand (respectively 5% and 4%), on concrete only little ringed plovers were found in Lisewo Malborskie (4% of statements). Foraging accounted for an average of 84% of the time in the budgets of the ringed plover and 75% of the little ringed plover. Apart from a few cases, the birds of both species of plovers spent more time on feeding than adult birds. The main method of feeding was making prey from the surface of the ground. This method of obtaining food in Pawłowice constituted from 53% to 72% of all feeding methods used by birds, and in Lisewo Malborskie from 84 to 100%. The method of sounding the beak of the ground was more frequently found in Pawłowice (8-36% of cases) than in Lisewo Malborskie (0-16% of cases). In this way they fed both young and adult birds of both species of plovers. Patter "foot-tremblig" was found mainly in Pawłowice. This method was often used by adult birds. The average intensity of feeding during the day was variable over time and increased in subsequent half-month periods in both species of plovers in Pawłowice with a meanness of 5.7 beaks / minute. up to 21.9 bows, and in Lisewo Malborskie with 9.9 beaks / min to 35.2 beaks / minute. At night, ringed plovers feeding 90% of the time, with feeding intensity at the level of six pecking per minute. In Pawłowice, in samples collected from Barber's traps, the dominant invertebrates on all types of substrate were

beetles and less numerous flies. The most numerous flies were observed on the mud. In Lisewo Malborskie, flies were the dominant group of invertebrates in almost all periods and types of ground. The dredge catcher of the invertebrate method showed that the dominant group of invertebrates in the ground at both research points were the flyworms from the *Chironomidae* family, constituting 60% in Pawłowice, and 89% of the inverted invertebrates in Lisewo Malborskie. Examining the actual food, it turned out that at both points the composition of the food was similar. These were mainly adult beetles, adults and flyworm larvae from the chironomids family. The share of beetles in the food composition was higher in Pawłowice. Significant differences in the composition of food between points were observed only in little ringed plovers, which in Lisewo Malborskie had half the number of beetles in collected samples than in Pawłowice. There were 42 cases of aggressive behavior, which usually ended with the acceptance of a threatening attitude. Aggressive behavior was more often observed in Lisewo Malborskie. The manifestations of such behaviors were directed mainly to the representatives of their own species and their frequency increased with a limited feeding area and a poorer food base found on the unregulated stretch of the river.