

Waders along inland rivers in Spain

Tomás Velasco

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Velasco, T., Avda América 130G, Toledo 45004, Spain.

INTRODUCTION

Available information about waders on inland rivers in Europe is limited (e.g. OAG Munster 1981; Joachim 1982; Broyer 1983; Grisser 1985) and is practically non-existent in Spain (Perrez-Chiscano 1975; Molina *et al.* 1987; Hernandez & Velasco 1990). However some stretches of inland Spanish rivers can provide, at least at times, suitable conditions for waders staging during migration, wintering and even, for some species, breeding grounds.

STUDY SITES AND METHODS

Between August 1982 and May 1991 a total of 1,343 km of inland Spanish rivers were surveyed. The length of the 56 different sections covered (some partially overlapping) varied from 0.5 to 25.0 km with an average total length of 4.1 km. Traversed sections are showed in Figure 1: the main ones, where most observations were made, are numbered (between 51.3%-100.0% in different months, with 75.8% average over total km). Table 1 shows the length of rivers surveyed in each month and year of the study.

In all cases, data was collected by walking along selected stretches and counting only those waders moving off in the same direction as the observer in order to avoid repetitive counts (Hernandez & Velasco 1990). The sections selected

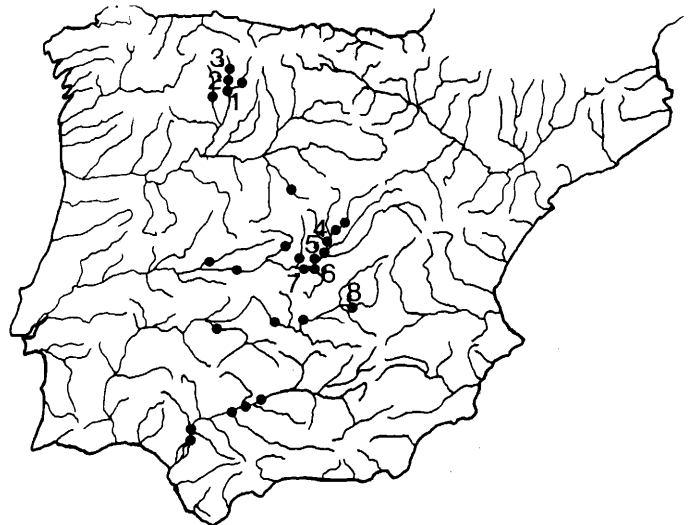


Figure 1. Principal river systems in the Iberian Peninsula and location of survey sections, with the principal localities numbered:

1. Esla-Bernesga river confluence, 4 km;
2. Bernesga river in Alija de la Ribera, 3 km;
3. Bernesga river in León-Sanat Olaja de la Ribera, 4 km;
4. Jarama river in San Martín de la Vega, 4 km;
5. Jarama river in Ciemozuelos, 3 km;
6. Tajo river in Algodor-Aceca, 6 km;
7. Tajo river in Toledo, 2 km;
8. Záncara river in Puente de San Benito, 1 km.

Table 1. The length (km) of rivers surveyed during each month and year of the study.

	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	TOTAL
January	-	26.0	14.0	8.0	8.0	8.0	6.0	8.0	14.0	13.0	105.0
February	-	24.0	7.0	4.0	-	-	4.0	4.0	13.0	6.0	62.0
March	-	43.0	34.0	10.0	16.0	3.0	6.0	4.0	31.0	6.0	153.0
April	-	25.0	5.0	-	11.0	23.0	12.0	3.0	15.0	17.0	111.0
May	-	47.0	18.0	11.0	-	41.0	4.0	11.0	10.0	22.0	164.0
June	-	22.0	2.0	7.0	5.0	1.0	9.0	13.5	17.0	-	76.5
July	-	41.0	8.0	5.0	14.0	5.0	8.0	21.0	7.0	-	109.0
August	8.0	-	-	20.0	-	-	15.0	14.0	17.0	-	74.0
September	20.0	59.0	28.0	12.0	4.5	1.0	5.0	9.0	17.0	-	155.5
October	27.0	33.0	21.0	4.0	10.0	5.0	9.0	9.0	13.0	-	131.0
November	15.0	29.0	8.0	4.0	4.0	1.0	7.0	13.0	16.0	-	97.0
December	26.0	29.0	12.0	4.0	-	1.0	7.0	12.0	14.0	-	105.0
TOTAL	96.0	378.0	157.0	89.0	72.5	89.0	92.0	121.5	184.0	64.0	1343.0



Table 3. Total number of birds and relative abundance of more numerous species (those with more than 5% over total number of birds fortnightly) in fifteen-day periods along annual cycle.

Fifteen day period	Total wader count	Relative abundance of different wader species						
January-1	5506	Vv(81.6)	Gg(14.2)					
January-2	4123	Vv(88.0)	Gg(10.0)					
February-1	2688	Vv(86.6)	Gg(11.3)					
February-2	1934	Vv(74.7)	Gg(13.1)	Pa(6.5)				
March-1	1722	Vv(46.4)	Gg(39.8)					
March-2	909	Gg(51.8)	Cd(16.2)	To(7.4)	Pp(7.1)	Hh(5.1)		
April-1	684	Gh(23.4)	Gg(12.9)	Cd(12.1)	Gp(11.3)	Hh(10.4)	Tt(8.0)	Ca(5.5)
April-2	1022	Hh(27.3)	Ah(27.2)	Cd(18.2)	Tt(6.3)			
May-1	935	Ah(33.3)	Hh(32.7)	Cd(20.3)	Tt(5.13)			
May-2	693	Hh(52.5)	Cd(23.2)	Ah(7.1)				
June-1	430	Hh(50.2)	Vv(25.3)	Cd(15.8)				
June-2	902	Hh(35.4)	Vv(29.7)	Cd(13.6)	To(11.1)			
July-1	2657	Hh(38.9)	Vv(38.5)	Cd(6.1)	To(5.4)	Ah(5.2)		
July-2	1731	Vv(28.6)	Hh(24.1)	Ah(21.9)	Cd(12.7)	To(6.1)		
August-1	1314	Vv(41.6)	Ah(15.0)	Cd(12.5)	Hh(11.0)	To(10.3)	Tt(6.8)	
August-2	3462	Vv(46.3)	Hh(17.4)	Cd(11.7)	Ah(9.5)	To(7.6)		
September-1	1479	Vv(60.3)	Gg(8.4)	Cd(7.7)	To(7.5)	Ah(5.3)		
September-2	4640	Vv(55.2)	Gg(15.9)	To(6.0)				
October-1	2079	Vv(44.7)	Gg(28.6)	To(8.1)				
October-2	1755	Vv(55.5)	Gg(30.3)	To(6.5)				
November-1	1437	Vv(61.1)	Gg(26.9)	To(5.4)				
November-2	4035	Vv(78.9)	Gg(16.7)					
December-1	1,844	Vv(80.3)	Gg(15.1)					
December-2	6,674	Vv(78.9)	Gg(17.2)					
TOTAL	54655	Vv(60.4)	Gg(13.8)	Hh(7.2)				

Key.

Ah, *Actitis hypoleucos* Ca, *Calidris alpina* Cd, *Charadrius dubius* Ch, *Ch. hiaticula* Gg, *Gallinago gallinago* Gp, *Glareola pratincola* Hh, *Himantopus himantopus* Pa, *Pluvialis apricaria* Vv, *Vanellus vanellus* Pp, *Philomachus pugnax* Tt, *Tringa totanus* To, *T. ochropus*

for survey were on the middle or low parts of the rivers, with little slope, relatively slow running water, and stony or muddy-sandy banks and islands whose extent and suitability for waders changes during the year according to water levels. Every bird observed on the river bed and adjacent flooded areas was counted in the surveys, including those on temporarily flooded grasslands, meadows, little ponds, stream mouths, fluvial gravel-pits, etc.

Data collected were grouped into fifteen-day periods, indicated in the tables by a postscript -1 or -2 after the name of the month. Variation in species abundance between them is indicated by means of a density index, D, expressed as birds/km (D = total number of birds/total number of km).

Since these river sections are parts of a continuous linear habitat, the accuracy of the counts on each river section will inevitably be affected by the entrance or exit of birds from both ends of the censused section (Hernandez & Velasco 1990).

RESULTS AND DISCUSSION

A total of 54,655 waders of 31 different species were

recorded during the study (Table 2). These included breeding birds, such as Black-winged Stilt *Himantopus himantopus* and Little Ringed Plover *Charadrius dubius*, with 4.0-7.9 and 2.5-2.6 birds/km in May-June respectively. An example of a length of river of importance for breeding waders is a 61 km stretch of the Jarama river, in the Madrid province of Central Spain. In May-June 1987 it was estimated that this stretch supported 106 pairs of Black-winged Stilt (1.7 pairs/km), 39 pairs of Little Ringed Plover (0.6 pairs/km), and four pairs of Stone Curlew *Burhinus oedicnemus* (0.1 pairs/km), in addition to the possibility of nesting Common Sandpiper *Actitis hypoleucos*.

Stone Curlew may use stony areas of the river bed and nearby grassland or uncultivated land as breeding sites. During the breeding season Collared Pratincole *Glareola pratincola* use the river beds only as feeding grounds or when displaced from nearby breeding areas (for example in La Mancha and Andalucia regions), although in other regions such as Extremadura, they may nest on rocky islands (Perez-Chiscano 1975).

In the post-breeding period (July-August) local breeding waders may concentrate on particular stretches of river.



Lapwing *Vanellus vanellus* and Black-winged Stilt dispersed over most stretches since the nesting areas (grasslands, lagoons, etc.) tend to have dried out by this time. Peak densities during this period are 15.9-10.8 birds/km in July/August for Black-winged Stilt and 15.8-30.4 birds/km for Lapwing in the same months (Table 2).

The principal wintering waders (December-January) include Lapwing (up to 89.9 birds/km during January) and Common Snipe *Gallinago gallinago* (up to 16.4 birds/km during December - the month in which this species is most abundant in Spain (Asensio & Carrascal 1982)). In addition, Green Sandpiper *Tringa ochropus* occurs in smaller numbers (up to 2.2 birds/km). Several other waders winter on the inland rivers of Spain, but in very small numbers. These include Little Ringed Plover, Golden Plover *Pluvialis apricaria*, Dunlin *Calidris alpina*, Redshank *Tringa totanus*, Greenshank *T. nebularia* and Common Sandpiper (Table 2).

During the migratory passages, the numbers of Little Ringed Plover, Ringed Plover *Charadrius hiaticula*, Golden Plover, Common Snipe, Redshank and Common Sandpiper are important in spring, and Stone Curlew, Little Ringed Plover, Ringed Plover, Common Snipe, Redshank, Greenshank, Green Sandpiper and Common Sandpiper in autumn. All of these species occur at densities of more than 1 bird/km during at least one fifteen-day period during the migration period (Table 2). The higher numbers of Stone Curlew, Golden Plover and Lapwing are due to use of wet grasslands, especially by Stone Curlew in autumn (October), Golden Plover in spring (February) and Lapwing in winter (January).

The relative abundance over the whole year of wader species comprising more than 5% of the total number of birds per fortnightly period, is given in Table 3. This shows that Lapwing and Common Snipe are the most numerous wintering birds (more than 85% added, in the period October to March); Little Ringed Plover, Ringed Plover, Common Snipe and Common Sandpiper the most numerous during spring passage; Black-winged Stilt and Little Ringed Plover are the commonest breeding waders; Black-winged Stilt and Lapwing are the most numerous in post-breeding period; and Lapwing and Common Sandpiper the most numerous during autumn passage. The above waders usually comprised more than 15% of the total number of birds during these periods.

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