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# Distribution of estuarine waders wintering in the Iberian Peninsula in 1978-1982

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## INTRODUCTION

Although the migration and wintering of waders of the East Atlantic Flyway, biologically link the Atlantic coasts of Portugal and Spain, the two countries have previously been dealt with separately in studies of this subject (see e.g. Alberto & Velasco 1988; Smit in press). In this article I describe specific wintering patterns along the coastline of the whole Iberian Peninsula.

## MATERIAL AND METHODS

The analysis is based on winter counts for the five years 1978-82, during which counts were carried out in both Spain (Alberto & Purroy 1981, 1984) and Portugal (Rufino 1978, 1982; CEMPA 1979, 1980, 1981).

The territorial division into regions is shown in Figure 1 together with the most important sites of each region. The mean number of winter birds per year during 1978-82 was calculated for each region and is expressed below as a percentage of the total for the whole Iberian Peninsula (obtained by summing the regional means). Regional counts that were discarded because of poor coverage are noted in Table 1.

## RESULTS

Table 1 lists the percentage distributions amongst the regions of Iberia of each of the 16 estuarine species and of all species combined. Those show that many more waders are in the Atlantic coast regions than in Mediterranean areas, with 90.6% on the east coast (Figure 1).

The low specific percentages for the Cantabrian region are explainable in terms of the predominantly non-estuarine coast, which has few habitats suitable for estuarine waders. The largest population

here is found in the Bay of Santona.

Of the many Galician estuaries the three most important wintering places are the Rias of Arosa, Ortigueira and Corme and Laxe (Dominguez 1988); the Ria de Arosa, in particular, is of international importance as a wintering wetland for the Grey Plover *Pluvialis squatarola* (Dominguez 1988).

The Portuguese regions of Minho, Douro Litoral and Estremadura lack suitable sites for waders, which are almost totally absent from these areas.

The chief wetland on the coast of the Beira Litoral region is the Ria de Aveiro, an internationally important wintering place for the Avocet *Recurvirostra avosetta*, the Ringed Plover *Charadrius hiaticula*, the Grey Plover and the Little Stint *Calidris minuta* (Luis *et al.* 1988).

The most important Iberian wintering wetland for waders is the Tagus estuary in the Ribatejo region: this one site supports almost 2/3 of Iberian Avocets, almost half the Grey Plovers and Dunlins *Calidris alpina* that winter in the Iberian Peninsula, and also the largest percentages of Bar-tailed Godwits *Limosa lapponica* and Redshanks *Tringa totanus*.

The only locality worth noting in the Baixo Alemtejo is the Ria de Sado, which has quite high percentages of Dunlins, Curlews *Numenius arquata*, Redshanks and Grey Plovers.

The two main sites in the Algarve are the Ria de Faro and, to a lesser extent, the Sapal de Castro Marim, whose importance both as a wintering place and as a stop-over area during migrations has recently been described by Rufino & Araujo (1987). This region has the greatest percentages of Knots *Calidris canutus*, Greenshanks *Tringa nebularia* and Turnstones *Arenaria interpres* of the entire Iberian Peninsula.



Table 1. Percentages of waders counted in different Iberian coastal regions in 1978-1982.

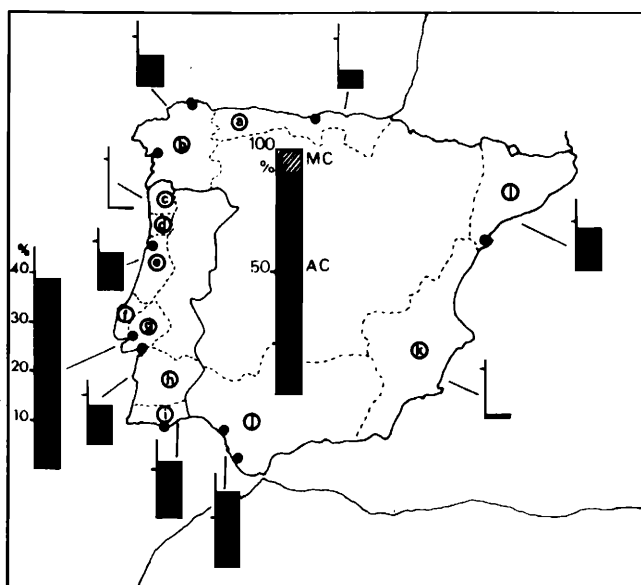
		REGION*									
		A	B	C	E	G	H	I	J	K	L
Oystercatcher	<i>Haematopus ostralegus</i>	1.8	<u>51.9</u>	0.7	5.8	2.4	9.2	15.8	12.2	0.1	0.1
Avocet	<i>Recurvirostra avosetta</i>				5.8	<u>64.6</u>	7.4	2.1	16.2	2.4	1.5
Ringed Plover	<i>Charadrius hiaticula</i>	1.0	5.2		13.9	16.7	4.2	17.2	<u>40.0</u> <sup>2</sup>	0.3 <sup>1</sup>	1.5
Kentish Plover	<i>Charadrius alexandrinus</i>		4.2		1.3	9.0	1.6	18.6	<u>62.1</u> <sup>2</sup>	1.3 <sup>1</sup>	1.9
Grey Plover	<i>Pluvialis squatarola</i>	1.4 <sup>3</sup>	8.9	0.1	4.7 <sup>4</sup>	<u>48.6</u>	10.0	9.5	10.5 <sup>3</sup>		6.3
Knot	<i>Calidris canutus</i>	20.3	25.0	2.7 <sup>5</sup>	5.0	9.0		<u>35.8</u> <sup>3</sup>		2.2 <sup>1</sup>	
Sanderling	<i>Calidris alba</i>	1.0	20.3	0.6	0.7	7.0		19.4 <sup>3</sup>	<u>33.8</u>	10.1 <sup>1</sup>	7.1
Little Stint	<i>Calidris minuta</i>	8.1			1.1	2.3	1.0	17.4		9.3 <sup>1</sup>	<u>60.8</u>
Dunlin	<i>Calidris alpina</i>	5.9	6.4		7.0 <sup>4</sup>	<u>42.2</u>	10.6	10.4 <sup>3</sup>	3.8 <sup>5</sup>	2.4 <sup>1</sup>	11.3
Black-tailed Godwit	<i>Limosa limosa</i>		1.6		6.5	23.1	3.5	6.6	<u>48.4</u> <sup>1</sup>	1.5 <sup>1</sup>	8.8
Bar-tailed Godwit	<i>Limosa lapponica</i>	0.5 <sup>3</sup>	2.7		28.2	<u>30.1</u>	4.5	27.3 <sup>3</sup>	3.3		3.4
Curlew	<i>Numenius arquata</i>	8.7	<u>28.1</u>	0.5	7.7 <sup>4</sup>	14.0	16.9	16.2 <sup>3</sup>	3.6 <sup>1</sup>	0.6	3.7
Spotted Redshank	<i>Tringa erythropus</i>		27.7		2.9	17.9		19.1 <sup>3</sup>	1.5		<u>30.9</u>
Redshank	<i>Tringa totanus</i>		5.1		6.9	<u>38.0</u>	12.7	15.3 <sup>3</sup>	12.8 <sup>1</sup>	1.1 <sup>1</sup>	8.1
Greenshank	<i>Tringa nebularia</i>	4.0	24.6		2.8	6.9	6.8	29.6 <sup>3</sup>	7.9		17.4
Turnstone	<i>Arenaria interpres</i>	5.0	15.3			2.4	8.5	<u>39.7</u>	23.5	3.7	1.9
All waders		3.5	6.2	0.1	7.5	<u>38.9</u>	7.9	11.5	15.1	0.9	8.5

\*Regions: A = Cantabrica, B = Galicia, C = Minho, E = Beiro Litoral, G = Ribatejo, H = Baixo Alemtejo, I = Algarve, J = Andalucia, K = Levante Almeria and L = Cataluna.

Superscript numbers indicate years for which counts were excluded, as follows: 1 1981; 2 1978, 1979 and 1981; 3 1978; 4 1980; 5 1978 and 1979.

Underlined values are the highest percentage for each species.

Figure 1



The most important Andalusian wetlands are the Marismas de Guadalquivir and the Salinas de Cadiz, which between them account for over half the Kentish Plovers *Charadrius alexandrinus* that winter in the Iberian Peninsula, and almost half the Ringed Plover *Charadrius hiaticula*, Sanderlings *Calidris alba* and Black-tailed Godwits *Limosa limosa*.

The region of Levante and Almeria has few wintering waders, the most important site being the Salinas de Santa Pola.

Finally, the chief wintering wetland in Cataluna is the Ebro delta, where almost all the waders of the region are recorded (Ferrer & Martinez-Vilalta 1981). It is a particularly important site for the Little Stint and also has 30.9% of Iberian wintering Spotted Redshanks *Tringa erythropus*.

Overall the main region is Ribatejo with about 40% of the waders wintering on the Iberian coasts, followed by Andalucia (15.1%) and the Algarve (11.5%). Table 2 lists reported numbers of waders wintering on the Spanish and Portuguese coasts. Since some 7 000 000 waders winter along the East Atlantic Flyway (Smit 1982;



Table 2. Numbers of waders (x 1,000) wintering in Spain (Sp), Portugal (Pt) and Iberian Peninsula (IB) according to: 1 - Prater (1976), 2 - Prater (1981), 3 - Alberto & Velasco (1988) (Spain only), and 4 - this study (mean of the years 1978-1982).

	1			2			3	4		
	Sp	Pt	IB	Sp	Pt	IB	Sp	Sp	Pt	IB
<i>Haematopus ostralegus</i>	1.9	0.5	2.4	1.5	0.8	2.3	1.8	1.1	0.6	1.7
<i>Recurvirostra avosetta</i>	+	11.0	11.0	3.5	12.7	16.2	7.2	3.5	14.0	17.5
<i>Charadrius hiaticula</i>	3.3	4.0	7.3	2.5	3.0	5.5	4.5	2.0	2.2	4.2
<i>Charadrius alexandrinus</i>		+	+	3.0	1.7	4.7	6.8	2.9	1.3	4.2
<i>Pluvialis squatarola</i>	0.6	5.0	5.6	3.0	7.1	10.1	5.8	2.6	7.1	9.7
<i>Calidris canutus</i>	10.0	5.0	15.0	1.2	0.5	1.7	0.2	0.6	0.6	1.2
<i>Calidris alba</i>		0.2	0.2	0.7	0.3	1.0	2.1	0.4	0.1	0.5
<i>Calidris minuta</i>				1.5	0.5	2.0	1.4	1.1	0.3	1.4
<i>Calidris alpina</i>	10.0	70.0	80.0	25.0	52.0	77.0	28.0	17.5	44.6	62.1
<i>Limosa limosa</i>	0.1	11.0	11.1	18.0	10.8	28.8	21.6	10.2	6.7	16.9
<i>Limosa lapponica</i>	0.1	1.0	1.1	0.3	5.3	5.6	1.7	0.5	4.5	5.0
<i>Numenius arquata</i>	2.2	1.5	3.7	1.6	1.7	3.3	3.2	1.5	1.9	3.4
<i>Tringa erythropus</i>		0.1	0.1	0.1	0.2	0.3	?	0.1	0.1	0.2
<i>Tringa totanus</i>	0.3	15.0	15.3	3.0	4.6	7.6	5.7	1.6	4.3	5.9
<i>Tringa nebularia</i>	+	0.1	0.1	0.1	0.1	0.2	?	0.1	0.1	0.2

Engelmoer *et al.* 1984), our figures show that at least 1.9% of this total population is found on Iberian shores.

## DISCUSSION

Though the percentages listed above may be regarded as giving an acceptably faithful picture of the distribution of estuarine waders wintering in the Iberian Peninsula, a number of methodological points should be borne in mind.

Firstly, that Iberian counts have generally concentrated on estuarine areas at the expense of large stretches of virtually unstudied shoreline that may possibly include important wintering sites for particular species, as Moser & Summers (1987) have found in Great Britain. It is therefore possible that proper studies of non-estuarine shoreline, especially in the north of the Peninsula, may lead to significant changes in the numbers and percentage distributions of species such as Turnstone, Oystercatcher *Haematopus ostralegus* and Purple Sandpiper *Calidris maritima* (Dominguez & Maneiro 1988).

Secondly, as Table 1 shows, the coverage of estuarine areas varies considerably from year to year. This has led us to ignore counts from certain regions, chiefly Algarve, Andalucia and Levant-Almeria, where counts in some very important sites, such as the Marimas del Guadalquivir, have not been carried out every year or have been carried out using compatible methods.

Thirdly, it should be noted that the percentages of certain species are affected by the large number of waders that have often been identified only at genus level in the counts carried out on Spanish coasts. Finally, attention must be drawn to the fact that over 85% of the waders wintering in the Iberian Peninsula do so at just nine sites: this implies the need for effective protection measures to be introduced.

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