MIGRATING WADERS ON THE ATLANTIC COAST OF GALICIA (NW SPAIN)

J. DOMÍNGUEZ & J.L. RABUÑAL

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Migrating waders on the Atlantic Coast of Galicia (NW Spain).– The use of the Atlantic coast of Galicia (NW Spain) by migrating waders is studied on the basis of spring counts made at the Ría de Arosa, Ría de Corme y Laxe and Ría de Vigo and autumn counts made at the Ría de Arosa. The flight strategies adopted by species wintering on the African coast mean that most species halt at Galician sites in only moderate-to-small numbers in spring and in similarly small contingents between early July and late September, when *Tringa totanus* is the predominant species.

Key words: Waders, Migration, Galicia, Iberian Peninsula.

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J. Domínguez, Depto. de Biología Animal, Fac. de Biología, Univ. de Santiago, España.– J.L. Rabuñal, c/ Fernando Macías 13 3.° d, 15004 A Coruña, España.

INTRODUCTION

The January counts carried out over the last 20 years in coastal areas of the Iberian Peninsula give a fairly good idea of the latter's importance for the wintering waders (ALBERTO & VELASCO, 1988). About 6.5 % of the total number of estuarine waders wintering in the Iberian Peninsula do so in the northwest (Galicia), mainly in the Ría de Arosa, Ría de Ortigueira and Ría de Corme y Laxe (DOMÍNGUEZ, in press). Less attention has been paid to the role these sites play in spring and autumn migration (AMAT et al., 1985; SMIT, in press). There have been isolated reports concerning several points on the Atlantic coast (DUGAN, 1980; LLIMONA et al., 1981; GALARZA, 1984; QUINTANA & FERNÁNDEZ, 1985; GAYOL & OBESO, 1987; LUIS et al., 1987; RUFINO & ARAUJO, 1987) or on the Mediterranean (CORDERO-TAPIA & LÓPEZ DE VILAR, 1985; MARTÍNEZ-VILALTA, 1985), but virtually nothing is know of the situation in Galicia (SOUZA, 1978; RAMÓN, 1989).

In this article data on waders stopping on the coast of Galicia during spring and autumn migrations is reported, and the role of the northwest Iberian coast in the East Atlantic flyway discussed.

STUDY AREA AND METHODS

Counts were carried out in the Ría de Arosa (42° 30' N-08° 50' W) in the intertidal complex of Umia-Grove, whose 948 ha constitute 54 % of all the intertidal surface of the Ría and where, throughout the year, live 80-90 % of all its waders (DOMÍNGUEZ, 1988); in the only large intertidal area (218 Ha) of the Ría de Corme y Laxe (43° 13' N-08° 55' W) and on the 1 km-long beach at Laxe, which faces the ocean; on the main intertidal area (500 Ha) in the Ría de Vigo (42° 10' N-08° 40' W) and on the whole intertidal area (1024 Ha) in the Ría de Ortigueira (43° 42' N-07° 50' W).

The whole Ría de Arosa was counted monthly from September 1984 to January 1987 as part of a wider study. The intertidal complex of Umia-Grove was surveyed about every 10 days during the spring mi-

gration of 1986 (April 1st to June 30th) and the autumn migration of 1985 and 1986 (July 15th to October 31st). Occasional counts were also carried out during the spring migration of 1985. In the Ría de Corme y Laxe counts were carried out weekly during the spring migration of 1986. During the springs of 1980-85 counts of the Ringed Plover *Charadrius hiaticula,* Grey Plover *Pluvialis squatarola,* Sanderling *Calidris alba,* Knot *Calidris canutus,* Dunlin *Calidris alpina* and Bar-Tailed Godwit *Limosa lapponica* were also made. In the Ría de Vigo, waders were counted during the spring of 1985, while the Ría de Ortigueira was surveyed monthly from September 1984 to September 1985.

In all cases, counting was carried out from 3 hours before to 3 hours after low tide using telescope and binoculars. In the Ría de Corme y Laxe supplementary counts were carried out at high tide roosting sites.

RESULTS AND DISCUSSION

The monthly counts of waders in the Ría de Arosa and Ría de Ortigueira suggest that these sites are used chiefly for wintering and much less as stopover places during migration (fig. 1), a trait common to most other Iberian coastal wetlands (RUFINO, 1984; CARRERA & MUÑOZ, 1986; MARTÍNEZ-VILALTA, 1985; LUIS et al, 1987; RUFINO & ARAUJO, 1987). It should nevertheless be borne in mind that intermittent counts do not in general detect all migrating visitors (KERSTEN & SMIT, 1984) because of the different average times spent at migration halts (MOSER & CARRIER, 1983; KERSTEN & SMIT, 1984).

Table 1. Numbers of waders counted on the intertidal complex Umia-Grove (Ría de Arosa) in spring 1985 and 1986. Hao. *H. ostralegus;* Rea. *R. avosetta;* Chh. *C. hiaticula;* Pla. *P. apricaria;* Pls. *P. squatarola;* Plsp. *Pluvialis sp.;* Vav. *V. vanellus;* Cac. *C. canutus;* Caf. *C. ferruginea;* Cal. *C. alpina;* Casp. *Calidris sp.;* Php. *P. pugnax;* Lil. *L. limosa;* Lip. *L. eapponica;* Lisp. *Limosa sp.;* Nup. *N. phaeopus;* Nua. *N. arquata;* Nusp. *Numenius sp.;* Tre. *T. erythropus;* Trt. *T. totanus;* Trn. *T. nebularia;* Trsp. *Tringa sp.;* Ach. *A. hypoleucos;* Ar. *A. interpres.* Dominant species in each count are underlined.

Censos en el complejo intermareal Umia-Grove (Ría de Arosa) durante los pasos primaverales de 1985 y 1986. Con subrayado se indica la especie dominante en cada censo.

	1985							1986										
day	22	22	17	30	17	08	20	13	12	02	10	19	07	14	24	03	14	24
month	II	III	IV	IV	V	VI	VI	II	III	IV	IV	IV	V	V	V	VI	VI	VI
Hao	309	166	139	25	114	85	85	241	248	163	173	134	152	100	152	155	69	126
Chh	197	26	22	11	29			119	42		39	27				81		
Cha											1							
Pls	1376	537	3	44	67			1126	805	62	156	139	70	79		87	86	89
Cac	55	9			343			40	27		1	1	14	24		90	21	3
Caf			1															
Cal	6181	2009	283	179	244			5070	2963	202	656	641	46	12		40		
Casp															45	2		
Php			8		1					2								
Lil	80	13	1	81	21		3	93	65	9				3				
Lip	436	51	23	27	56	6	16	169	290	96	102	119	28	6	6	3	3	4
Nup			192	161	86	18	11	1	2	5	29	135	113	52	16	14	7	8
Nua	222	26	20	12	15	3	5	219	89	15	26	46	21	10	1		14	36
Nusp					8	1	2											
Tre	1	3	2															
Trt	455	147	25	3				247	314	9	9		7		1	19		5
Trn	29	37	24		2			23	25	11	42	13	4	1	2	1		2
Trsp							1											
Ach	2		2	1				1	1									
Ari	25	29	4		9			38	20	3	13		2	2		3		7

Spring migration

Phenology

Table 1 lists the populations counted in the Ría de Arosa in the springs of 1985 and 1986, and table 2 those of the Ría de Corme y Laxe in spring 1986. In these estuaries the departure of wintering birds takes place in late February and the whole of March. It thus overlaps the arrival of spring migrants (fig. 1), which can be detected in the area until early June.

The spring populations of Ringed Plover, Dunlin, Bar-Tailed Godwit, Whimbrel *Numenius phaeopus* and some other species had a single peak between mid April and mid May, and that of Knot, as at other Iberian estuaries on the Atlantic (DICK et al., 1987; RUFINO & ARAUJO, 1987), a single peak between the second fortnight in May and early June. The population of *Pluvialis squatarola,* on the other hand, had both a February peak similar to that observed elsewhere in the Iberian Peninsula (LUIS et al., 1987; RUFINO & ARAUJO, 1987), and a second in the second fortnight in April coinciding with the late peaks recorded in the Ría de Faro (RUFINO & ARAUJO, 1987) and the Ría de Avilés (QUINTANA & FERNÁNDEZ, 1985).

Another species with both early and late influxes is Sanderling, which first arrives in the Ría de Arosa in late February (DOMÍNGUEZ, 1988). Wave is also recorded at this time in the Ría de Faro (RUFINO & ARAUJO, 1987) and reaches British and Dutch estuaries in early March (FERNS, 1980; Roselaar in CRAMP & SIMMONS, 1983). The second, larger, wave arrives between mid April and mid May. It seems plausible that the two peaks derive from populations nesting in different regions. the probable arrival of nearctic Sanderlings at their breeding grounds slightly earlier than Siberian birds (Ferdinand in BERNIS, 1966a; CRAMP & SIMMONS, 1983), and the fact that

Table 2. Numbers of waders counted on the Ría de Corme y Laxe in spring 1986. Dominant species in each count is underlined.

Censos en la Ría de Corme y Laxe durante el paso primaveral de 1986. Con subrayado se indica la especie dominante en cada censo.

day	05	12	19	26	01	03	10	17	25	01	07	14	22	28
month	IV	IV	IV	IV	V	V	V	V	V	VI	VI	VI	VI	VI
H. ostralegus	70	70	52	49	54	46	41	37	34	28	31	32	39	34
H. himantopus							6							
R. avosetta	1	1	1											
B. oedicnemus								1						
C. hiaticula	13	27	6	7	35	37	3	3	4	59	58	26	4	4
C. alexandrinus	3	3	3	2	5	7	4	4	3	4	4	4	8	8
P. apricaria	2	5												
P. squatarola	38	38	16	16	24	23	10	6	5	14	12	3	2	1
C. canutus	8	8	7	8	9	8	1			3	2	5	3	
C. alba	45	37	31	12	3	4	2		1	1	17	5		
C. minuta											5		1	
C. ferruginea	1													
C. alpina	104	265	40	21	55	47	40	11	4	21	60	5	2	1
L. limosa	4	4	2		1	1	1	1	1	2	2	2	1	1
L. lapponica	40	40	30	24	41	41	10	13	9	11	12	12	3	5
N. phaeopus	3	3	3	9	10	9	7	2	6	1		1	2	4
N. arquata	6	6	6	6	11	11	8	12	12	11	15	15	48	85
T. totanus							2			10		7		
T. nebularia	11	11	11	7	4	3	1					1	1	
A. hypoleucos		1		9	9									
A. interpres					4	6	4			1				

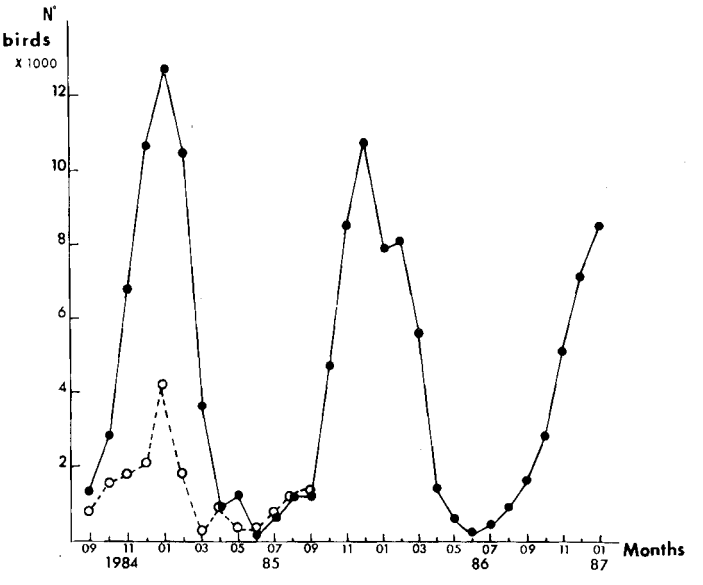

Fig. 1. Monthly changes in the abundance of waders in Arosa (•) and Ortigueira (○).
Evolución mensual de la poblaciones de limícolas de las rías de Arosa (•) y Ortigueira (○).

Sanderling ringed in Greenland and Iceland have been observed or captured in the British Isles in March (FERNS, 1980), suggest that the first wave may come from the nearctic zone and the second from Siberia (and perhaps the closer nearctic areas).

Turnstone have an early passage too. In non-estuarine coast of Galicia Turnstone has a peak in early March, with scarce passage in April and May (DOMÍNGUEZ, 1988).

Numbers

There were marked interannual differences in the numbers of waders counted. The figures for 1985 and 1986 were so small (fig. 2) that, in both the Ría de Arosa and Ría de Corme y Laxe, the predominant species in some counts was Oystercatcher *Haematopus ostralegus,* most of which must have wintered in these locations. The highest counts recorded in the Ría de Corme y Laxe between 1980 and 1985 were in 1982 and 1984, especially for Dunlin (fig. 3). These annual spring counts also suggest that the migrating waders's visits are on average quite short, as may be true for the whole Iberian coastline (SMIT, in press).

On the basis of the numbers counted in the Ría de Arosa and Ría de Corme y Laxe, three groups of species may be distinguished. The first contains only Dunlin, which invariably has its peak populations in the high hundreds and is the only species where it is fairly common to record over a thousand individuals at a single site, e.g. in the Ría de Corme y Laxe in 1982 and 1984 and in the Ría de Aveiro in spring 1987 (LUIS et al., 1987).

The second group, with peaks usually in the low or middle hundreds, includes Ringed Plover, Grey Plover, Bar-Tailed Godwit and Whimbrel. Sanderling and Turnstone *Arenaria interpres* also qualify for this group, but they prefer open beaches and rocky habitats respectively, rather than intertidal estuarine zones.

The third group, with spring peaks generally less than a hundred individuals per site, comprises Knot, Little Stint *Calidris minuta,* Curlew Sandpiper *Calidris ferruginea,* Ruff *Philomachus pugnax,* Black-Tailed Godwit *Limosa limosa,* Redshank *Tringa totanus,* Greenshank *T. nebularia* and Spotted Redshank *T. erythropus.* At southern Iberian sites there are records, at least for some years, of much larger migrating populations of Little Stint (COLSTON & COWLES, 1963), Curlew Sandpiper (DUGAN, 1980), Black-Tailed Godwit (FEENY et al., 1960; LISTER, 1984) and Spotted

Redshank (LISTER, 1984). The springs counts of Oystercatcher and Curlew *Numenius arquata* in the Rías probably include wintering and summering birds in the same localities. In the whole of Atlantic Iberian coast the spring passage of both species also is very small (GALARZA, 1984; QUINTANA & FERNÁNDEZ, 1985; CARRERA & MUÑOZ, 1986; LUIS et al., 1987; RUFINO & ARAUJO, 1987; DOMÍNGUEZ, 1988).

On the whole, though depending in part on site characteristics, this classification on the basis of the size of the transient population also applied to the other NW Iberian sites for which data are available: the Ría de Ortigueira (DOMÍNGUEZ, 1988), the Ría de Ribadeo (CARRERA & MUÑOZ, 1986), the Ría de Avilés (QUINTANA & FERNÁNDEZ, 1985) and the Ría de Aveiro (LUIS et al., 1987).

Flight strategies

The data for the northern Iberian Atlantic coast obtained in this and other studies appear to fit quite well into the scheme of flight strategies (hop, skip and jump) proposed by PIERSMA (1987) for species wintering on the Atlantic coast of Africa. Early migrant Turnstone, for example, use the hop strategy, with

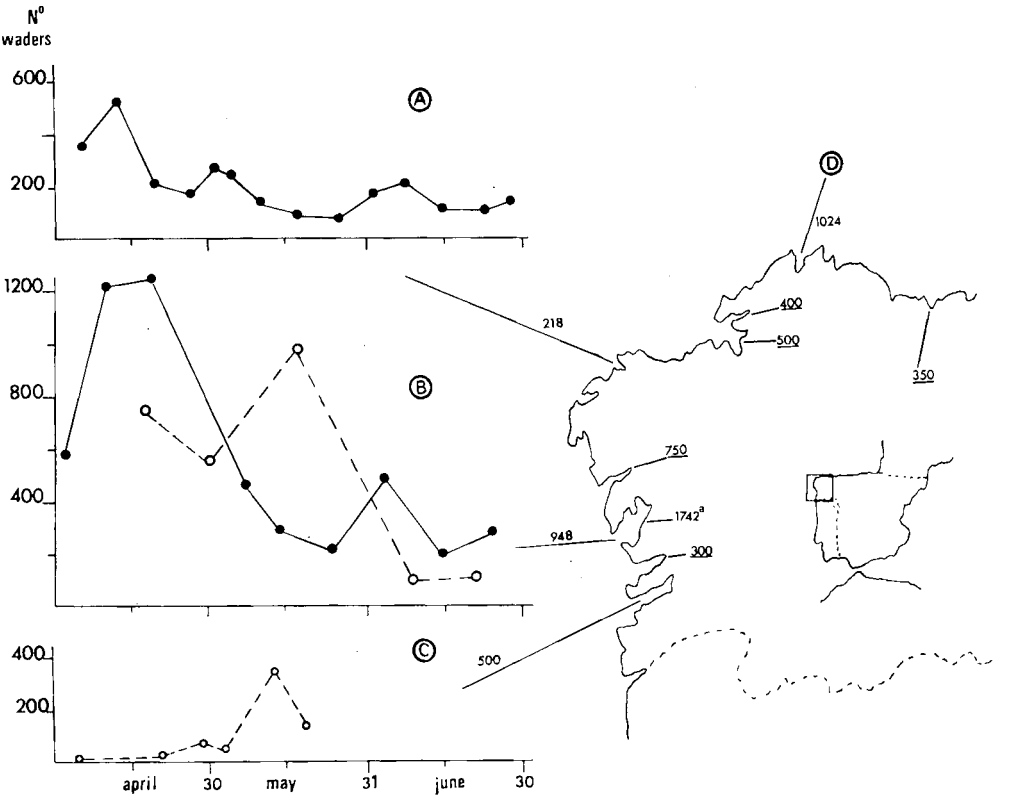

Fig. 2. Numbers of waders counted on the Ría de Corme y Laxe (A), intertidal complex Umia-Grove (Ría de Arosa) (B) and Ría de Vigo (C) in spring 1985 (---) and 1986 (——). (D) Ría de Ortigueira. The mudflat surface (in ha) of these and other Rías is indicated. 1742ª is referred to the whole Ría de Arosa.

Número de limícolas en las rías de Corme y Laxe (A), complejo intermareal Umia-Grove (Arosa) (B) y Ría de Vigo (C) durante los pasos primaverales de 1985 (---) y 1986 (——). (D) Ría de Ortigueira. Se indica la superficie intermareal (ha) de éstas y otras rías. 1742ª indica la totalidad de la superficie intermareal de Arosa.

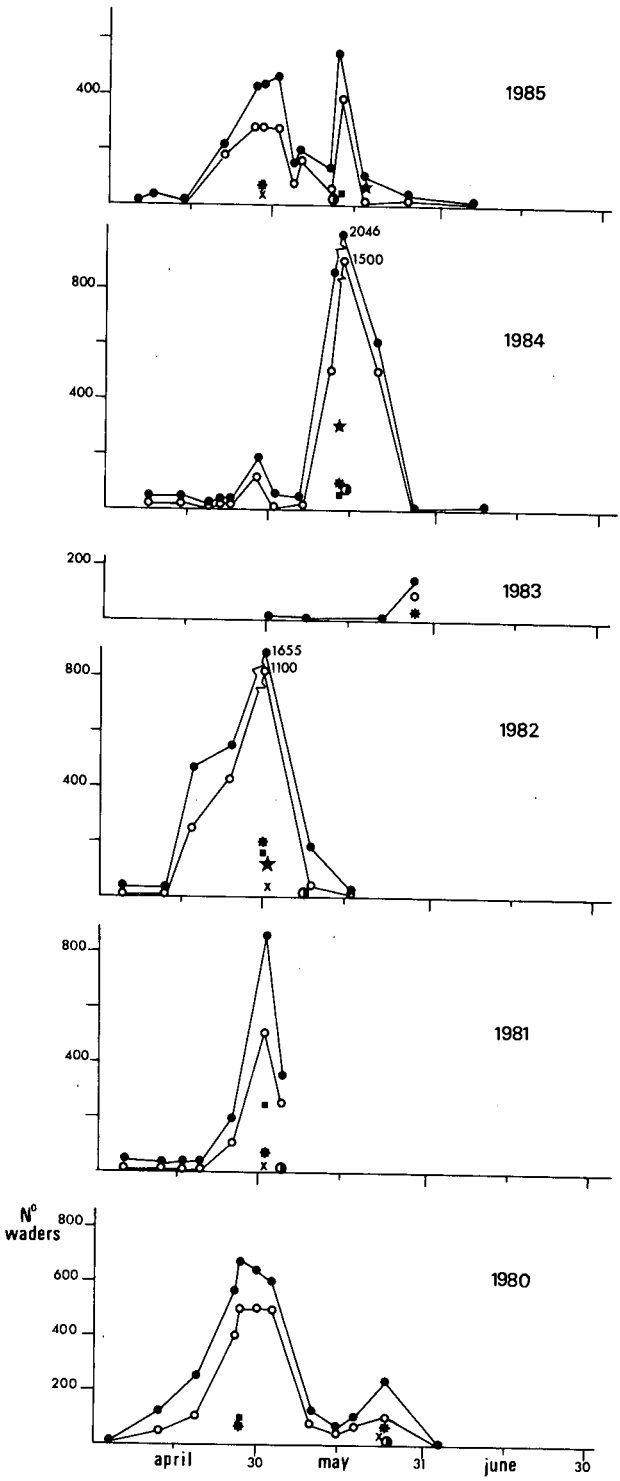

Fig. 3. Numbers of six wader species counted in the Ría de Corme y Laxe during springs 1980-85. • six species; ○ Dunlin. Only maximum peak: ✱ Ringed Plover; ■ Bar-Tailed Godwit; ★ Sanderling; ○ Knot; X Grey Plover.

Censos de 6 especies de limícolas realizados en la Ría de Corme y Laxe durante los pasos primaverales del período 1980-85. • seis especies; ○ Correlimos Común. Sólo máximo censo: ✱ Chorlitejo Grande; ■ Aguja Colipinta; ★ Correlimos Tridáctilo; ○ Correlimos Gordo; X Chorlito Gris.

short flights and frequent halts. This coincides with their preference for rocky, non-estuarine shores, which prevents the concentration of large, easily countable flocks; only very small numbers have been observed either in the present study or at some other Iberian coastal sites (SOUZA, 1978; GALARZA, 1984; QUINTANA & FERNÁNDEZ, 1985; CARRERA & MUÑOZ, 1986). However sizeable peaks have been detected in March in the Ría de Faro (RUFINO & ARAUJO, 1987) and on rocky stretches of the Galician coastline (DOMÍNGUEZ, 1988). The fact that large numbers of this species are found in estuaries in Portugal may be due to the absence of the rocky stretches that attract them in Galicia and the rest of northern Iberia (DOMÍNGUEZ, 1988). In April and May the Turnstone counts in the Atlantic Iberian coast are very low (GALARZA, 1984; QUINTANA & FERNÁNDEZ, 1985; CARRERA & MUÑOZ, 1986; LUIS et al., 1987; DOMÍNGUEZ, 1988). This suggests that these birds probably fly over the Iberian Peninsula without stopping.

Another wader that may use the hop strategy is Sanderling, though the available data are ambiguous on this point. The Galician counts show that there are some years in which appreciable numbers halt there, but others when Galicia is passed by. The former include 1984, when 300 birds were recorded on the beach at Laxe in the first ten days of May, and 1987, when maximum populations of 800-1000 were counted on some beaches (RAMÓN et al., in press). Since the total population of the Atlantic coast of Africa is estimated as 150.000 (ENGELMOER et al., 1984), these figures make Galician an important stopover site. Equally large numbers have been recorded in the south of the Iberian Peninsula (LISTER, 1984; RUFINO & ARAUJO, 1987). It may therefore also be expected that large numbers of birds may stop on the hundreds of kilometers of open beach in Portugal, for which no data are available. But since several reports suggest that Sanderlings may halt at only a few estuaries during migration (PRATER & DAVIES, 1978; FERNS, 1980; CRAMP & SIMMONS, 1983), a definitive conclusion as to the migration flight strategy of Sanderling awaits further data for the many potential stopover sites on the Portuguese coast.

According to PIERSMA (1987), both Dunlin and Redshank use the skip strategy, consisting in non-stop flight from NW Africa to the French coast. The northern Iberia data are in keeping with this notion, since even if the total number of Dunlin halting at wetlands were much greater than those counted on the northern Iberian coast, it would still be very small in comparison with the estimated one million birds that winter on the west coast of Africa (ENGELMOER et al., 1984). Again virtually no *T. totanus* have been observed in spring in northern Iberia in this study or others (SOUZA, 1978; GALARZA, 1984; QUINTANA & FERNÁNDEZ, 1985; CARRERA & MUÑOZ, 1986). The situation of Redshank in southern Iberia is less clear. Though RUFINO & ARAUJO (1987) counted very few birds in the Ría de Faro in April and May, peaks in the hundreds have been observed in the Algarve (LISTER, 1984) and on Andalusian coast (FEENY et al., 1960; COLSTON & COWLES, 1963), though part of these populations may consist of birds nesting locally.

The third of Piersma's flight strategies, the jump, consists of a non-stop flight from the Banc d'Arguin to the Wadden Sea (PIERSMA, 1987). This strategy is employed by Knot and Bar-Tailed Godwit. The data for Spanish Atlantic sites are on the whole in keeping with this, since the numbers of Bar-Tailed Godwit counted (SOUZA, 1978; GALARZA, 1984; QUINTANA & FERNÁNDEZ, 1985; CARRERA & MUÑOZ, 1986) make up only a small fraction of the estimated 600,000 birds wintering on the African coast (ENGELMOER, et al., 1984). A similarly small proportion of the 400,000 Knot wintering in western Africa (ENGELMOER et al., 1984) halt in northern Iberia, though some sites in the southern Iberian Peninsula, especially the Ria de Faro (RUFINO & ARAUJO, 1987), may be used as resting points by a relatively large number of birds.

SMIT (in press) has suggested that, in view of the low weight of many waders caught on the Atlantic coast of Morocco (KERSTEN et al.,

1983), as many as a million may use the Iberian coast as a refuelling station during spring migration. The small numbers of many species observed at any one time at Iberian sites would be compatible with this suggestion only if the turnover of waders were very rapid. Verification or rejection of Smit's hypothesis will therefore require studies on the kind carried out by KERSTEN & SMIT (1984) on the Moroccan coast which estimated the total number of birds stopping at a site during spring migration, rather than just the number present at any one time.

The data available for the Atlantic coast of Iberia suggest that there is a NS gradient as regards the use of estuarine sites as resting sites for migrating waders, the most frequented sites lying in the south. The Galician coast appears to lie between two main resting areas. One is made up largely of the Atlantic coast of Morocco (KERSTEN & SMIT, 1984), though it probably also includes certain sites in the south of the Iberian Peninsula. The other comprises the intertidal grounds of the Wadden Sea (LAURSEN & FRIKKE, 1984; PROKOSCH, 1984) and of certain estuaries in Britain (PRATER, 1981) and France (BREDIN, 1985; BREDIN & DOUMERET, 1986). With regard to southern Iberia, it is clear that the Ría de Faro may be important for the spring migration of many waders wintering in NW Africa (RUFINO & ARAUJO, 1987), and the data for other Portuguese and Andalusian coastal sites, though unfortunately scarce, seem to point in the same direction (FEENY, et al., 1960; COLSTON & COWLES, 1963; DUGAN, 1980; LISTER, 1984). These sites in the southern Iberian Peninsula appear to be the last areas in which many species wintering on the W Africa coast can rest and recover their strength before flying on to the the estuaries of Britain and continental Europe. Certainly, this notion is in keeping both with the spring migration strategies suggested for various waders by PIERSMA (1987), and with the small numbers of migrants counted in the present study and at other sites on the northern Iberian coast, whether on the Atlantic (SOUZA, 1978; GALARZA, 1984; QUINTANA & FERNÁNDEZ, 1985; CARRERA & MUÑOZ, 1986; DOMÍNGUEZ, 1988) or the Mediterranean (MARTÍNEZ-VILALTA, 1985). However, flight patterns are greatly influenced by prevailing meteorological conditions, which can vary widely from year to year (BERNIS, 1966b; ELKINS, 1983), and the NW Iberian estuaries may be used by «jumping» migrants as critical «emergency»-sites in the years that fattening conditions in W Africa or winds in route are unfavourable (SMIT & PIERSMA, 1989). Therefore, the true average value of the sites covered in this study, and of the northern Iberian coast in general, can only be reliably determined on the basis of series of counts covering many years.

Autumn migration

Most of the summer visitors observed in the Ría de Arosa in June, when little wader passage occurs (especially in the second fortnight), are immature *H. ostralegus* and Curlew *Numenius arquata* (DOMÍNGUEZ, 1988). The same is true of most other sites on the coasts of Galicia and Cantabria (GALARZA, 1984; QUINTANA & FERNÁNDEZ, 1985; CARRERA & MUÑOZ, 1986; DOMÍNGUEZ, 1988; RAMÓN, 1989).

Table 3 lists the wader populations counted on the intertidal complex Umia-Grove during the autumn migrations of 1985 and 1986. The first autumn migrants arrive in the first fortnight in July, but it is not until the beginning of October that large numbers appear. In particular, the Ría de Arosa, like other northern Spanish sites (GALARZA, 1984; QUINTANA & FERNÁNDEZ, 1985; CARRERA & MUÑOZ, 1986; DOMÍNGUEZ, 1988; RAMÓN, 1989) receives very few Dunlins during July, August and September. In the ría de Aveiro, on the other hand, LUIS et al. (1987) counted 5600 birds in August (the annual peak), while RUFINO (1984) counted over 2000 in the Tejo estuary at the end of July. Though far from conclusive, these figures suggest non-stop flights from sites north of the Iberian Peninsula to the western Iberian coast. These early autumn migrants belong to the subspecies

Tabla 3. Autumn counts of waders (1985 and 1986) on the intertidal complex Umia-Grove (Ría de Arosa). Abbreviations of species' names as in table 1. Dominant species in each count is underlined.
Censos otoñales en el complejo intermareal Umia-Grove (Ría de Arosa) durante 1985 y 1986. Símbolos de especies como tabla 1. Con subrayado se indica la especie dominante en cada censo.

	1985											1986									
day	17	25	05	15	25	05	13	22	04	18	29	15	25	05	15	25	07	18	25	13	23
month	VII	VII	VIII	VIII	VIII	IX	IX	IX	X	X	X	VII	VII	VIII	VIII	VIII	IX	IX	IX	X	X
Hao	116	79	107	128	145	219	204	249	240	277	336	128	132	111	133	125	212	203	205	265	315
Rea												14									
Chh				31	31	11	87	78	103	132	160			11	35	28	20	17	6	164	70
Pla							2			5	6					1		1			
Pls	15	17		26	55	32	64	68	110	168	211	99	58	35	108	66	64	156	122	120	156
Plsp									2												
Vav											2										
Cac	5	8		4	27		3	11	34	12	26	1		3		11		20		30	32
Caf											2										
Cal	15	65	4	123	142	55	56	59	298	1063	2416	2	3	20	39	36	75	88	205	1225	1787
Casp							2														
Lil	12	28	32	39	58	57	75	99	112	189	127		13	8	2	44	63	63	74	109	147
Lip	22	18	33	90	84	157	138	160	160	68	228	23	39	44	51	103	101	90	124	135	135
Lisp	3	2																			
Nup	37	54	61	88	16	4	1	3		11	6	18	45	59	34	18	12	4	7	1	2
Nua	110	264	52	46	130	57	90	91	190	145	202	5	51	144	9	116	34	171	82	151	166
Nusp			43		6																
Tre									1												
Trt	219	170	315	452	331	228	211	305	342	365	438	118	137	264	240	245	321	385	412	408	411
Trn	8	15	13	27	33	21	21	24	38	23	41	6	19	22	14	23	21	32	38	68	39
Trsp									2												
Ach							2	1	2						1		1		2		1
Ari					2				2			4						3			10

schinzii, which winters chiefly in NW Africa (CRAMP & SIMMONS, 1983), whereas the large numbers of Dunlins that arrive in the Ría de Arosa and the Tejo estuary (RUFINO, 1984) during October must belong mainly to the nominal subspecies, which predominates on the Iberian coast during winter and moults on British and continental Europe (PIENKOWSKI & PIENKOWSKI, 1983). The *schinzii* that winter in the Iberian Peninsula come from Scandinavia (JÖNSSON, 1986).

The predominant species in almost all counts in July, August and September was *T. totanus,* though the maximum population never exceeded 500 birds in either 1985 or 1986. The Ría de Arosa appears to be the only wetland of the northern Spanish Atlantic coast to receive relatively large numbers on this species in autumn, the numbers counted at other sites being very small (SOUZA, 1978; GALARZA, 1984; QUINTANA & FERNÁNDEZ, 1985; CARRERA & MUÑOZ, 1986; DOMÍNGUEZ, 1988; RAMÓN, 1989). The same holds in winter, when the Ría de Arosa has a population of about 500 Redshanks while those of other northern estuaries all number less than a hundred (GALARZA, 1984; QUINTANA & FERNÁNDEZ, 1985; CARRERA & MUÑOZ, 1986; CALLEJO, 1987; DIEGO, 1988; DOMÍNGUEZ, 1988). In the southern Iberia, on the other hand, large numbers of autumn migrants halt, 5500 having been counted in the Tejo estuary in late July (RUFINO, 1984) and transient populations in the hundreds having been observed at several Andalusian sites (CABOT et al., 1979; LLIMONA et al., 1981). Some of these birds may be native to the area, but the great majority must come from N Europe and cross the N Iberian Peninsula without stopping. The same migration scheme seems to be followed

by Black-Tailed Godwit, wich in august likewise appears in very small numbers in northern Spain but in flocks of up to 4500 in the south (CABOT et al., 1979; LLIMONA et al., 1981; RUFINO, 1984).

No other species of wader gathers in large numbers in the areas studied during autumn migration. It should nevertheless be borne in mind that, as in spring, a fast turnover rate would make the total number of visitors much higher than the number counted at any one time.

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RESUMEN

Migración de limícolas en la costa atlántica de Galicia (NO España).

Se estudia la migración de limícolas por la costa atlántica de Galicia en base a los censos primaverales realizados en las rías de Arosa, Corme y Laxe y Vigo (tablas 1 y 2) y los otoñales efectuados en Arosa.

La mayoría de las especies muestra paso primaveral moderado o escaso, consecuencia de la posición geográfica del litoral septentrional ibérico entre dos núcleos de sedimentación principales y en relación con las estrategias de vuelo adoptadas por las especies invernantes en la costa africana. Estos núcleos son la costa meridional ibérica y atlántica marroquí y áreas intermareales del atlántico francés, británico y del Mar de Wadden.

Fenológicamente Chorlitejo Grande, Correlimos Común, Aguja Colipinta y Zarapito Trinador se caracterizan por presentar máxima sedimentación entre mediados de Abril y mediados de Mayo y Correlimos Gordo entre la segunda quincena de Mayo y principios de Junio. Especies con dos picos migratorios son Chorlito Gris, finales de Febrero y segunda mitad de Abril, y Correlimos Tridáctilo, finales de Febrero y entre mediados de Abril y mediados de Mayo (figs. 2 y 3).

Los censos parecen confirmar asimismo las estrategias de vuelo y sedimentación propuestas por PIERSMA (1987) para distintos limícolas invernantes en el litoral NW africano, consistentes en vuelos cortos y frecuentes escalas en Vuelvepiedras y quizás Correlimos Tridáctilo, vuelos directos entre el Banco d'Arguin y Francia en Correlimos Común y Archibebe Común y vuelos sin escalas entre el litoral africano y el Mar de Wadden en Correlimos Gordo y Aguja Colipinta.

El paso otoñal por Arosa es escaso, con bajas cantidades entre julio y septiembre, siendo *Tringa totanus* la especie dominante en este período (tabla 3). Los censos existentes en el litoral atlántico ibérico, sugieren vuelos masivos, sin escalas, de Correlimos Común, Archibebe Común y Aguja Colinegra desde localidades septentrionales europeas hasta humedales del S y W peninsulares.

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