Table 1. Main wintering localities of Kentish Plover in Spain, with their average number in brackets, and the average totals by zones. (+) = less than 25 birds. s = sporadic.

Zones	Number	Main localities
Atlantic Galicia	100	Corrubedo and estuaries of Corme and Lage, Arosa, Ortigueira and Vigo
Cantabria	s	Estuaries of Viveiro, Barqueiro and Guernica
Mediterr-anean	500	Ebro Delta (100), and salt-pans of Santa Pola (75), Torrevieja (75), and Almería (50)
Balearic Islands	200	Salobrar de Campos (60), Estany Pudent (40), and salt-pans of Ibiza (30), and Fornells (30)
Western Andalucia	7,200	Cádiz Bay (4,000), Guadalquivir Marshes (2,600), Huelva Marshes (200), Ayamonte and I. Cristina (150)
Canary Islands	400	Fuerteventura (200), Lanzarote (100)
Inland	100	Majavacas pool (+), Fuentepiedra pool (+)
Total Spain	8,500	Cadiz Bay (4,000), Guadalquivir Marshes (2,600)

Finally, from the data available of the complete period, the overall distribution of the Kentish Plover wintering in the whole of Spain is analysed by six biotopes (Figure 2). The salt-pans and the rice fields hold more than 70% of the estimated wintering population, indicating the importance of these man-made areas for Kentish Plover. The inland areas and coastal lagoons hold a low proportion of winterers, with shores and estuary mudflats being intermediate. A more extensive exploration of the rice fields and shores would possibly change the relative importance of the these habitats (Figure 2). Although the salt-pans is now the main winter biotope, rice fields can be the most important biotope.

REFERENCES

Alberto, L.J. & Velasco, T. 1988. Limícolas invernantes en España. J.L. Tellería (Ed.): *Invernada de aves en la Península Iberíca*, pp 71-78. Monografías de la SEO, no 1. Madrid. 208pp

Cramp, S. & Simmon, K.E.L. (Eds.). 1982. *The Birds of the Western Palearctic*, vol. 3. Oxford. 913pp.

Erard, CH. & Vielliard, J. 1965. Comentarios sobre avifauna invernal en el Oriente español. *Ardeola*, 11: 95-100.

Glutz, U.N., Bauer, K. M. & Bezzel, E. 1975. *Handbuch der Vögel Mitteleuropas*, vol. 6. Akad. Verlag. Wiesbaden. 840pp.

Telleria, J.L. 1981. *La migración de la aves en el Estrecho de Gibraltar, vol. 2: Aves no planeadoras.* Ed. Universidad Complutense. Madrid. 491pp.

Velasco, T. & Alberto, 1993. Number, main localities and distribution maps of waders wintering in Spain. *Wader Study Group Bull.* 70: 33-41.

Phenology and distribution of waders ringed in Spain from the scheme Madrid Museo de Ciencias

F. Cantos & A. Fernández

Cantos, F. & Fernández, A. 1994. Phenology and distribution of waders ringed in Spain from the scheme Madrid Museo de Ciencias. *Wader Study Group Bull.* 73: 55-60.

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INTRODUCTION

Wader studies in Spain are few, with the exception of census work (Alberto & Velasco 1986; Martínez-Vilalta 1991), some studies concerned with wader communities (Souza 1978; Cordero-Tapia & López de Villar 1985; Martínez-Vilalta 1985b; Rubio 1986), breeding ecology and population size (Martínez-Vilalta 1985a; Domínguez *et al.* 1987; Souza & Domínguez 1989), wintering populations and wader migration (Bernis 1966; Asensio & Carrascal 1987; Alberto & Velasco 1988), and, recently, with wader ringing (Barbosa & Asensio 1990).

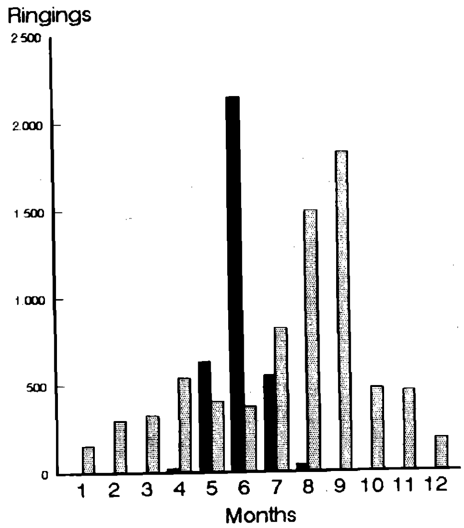

Figure 1. Seasonal pattern of ringing of chicks and fledglings/adults for the 30 least common waders.

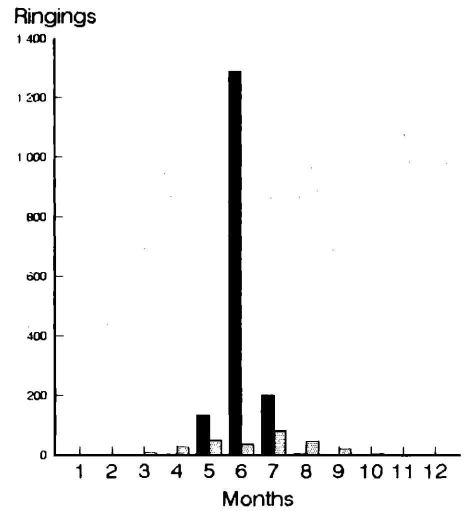

Figure 2. Seasonal pattern of ringing of chicks and fledglings/adults of Black-winged Stilt *Himantopus himantopus*.

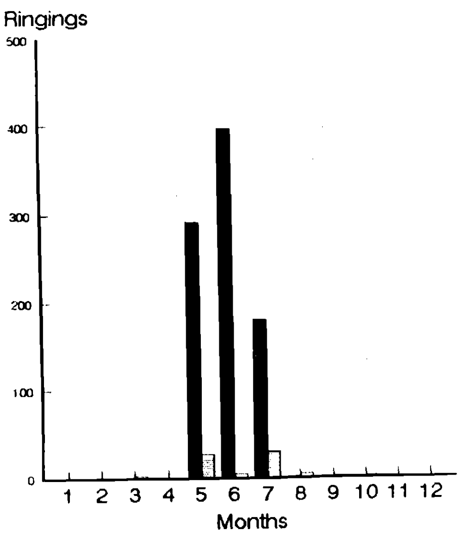

Figure 3. Seasonal pattern of ringing of chicks and fledglings/adults of Avocet *Recurvirostra avosetta*.

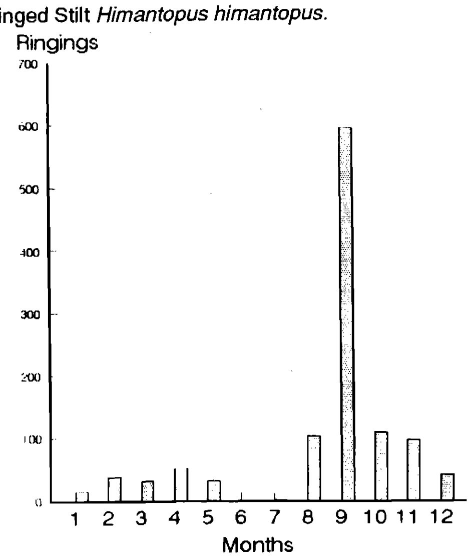

Figure 4. Seasonal pattern of ringing of chicks and fledglings/adults of Dunlin *Calidris alpina*.

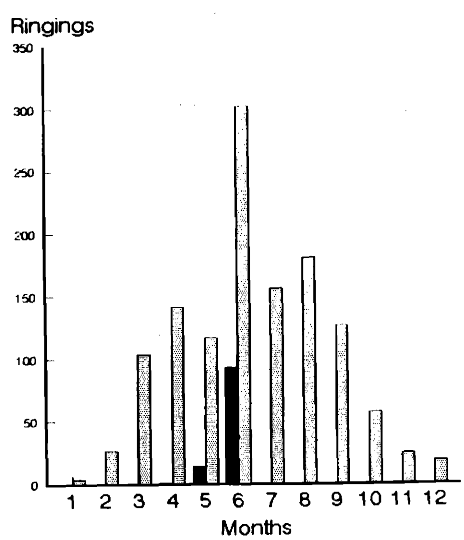

Figure 5. Seasonal pattern of ringing of chicks and fledglings/adults of Redshank *Tringa totanus*.

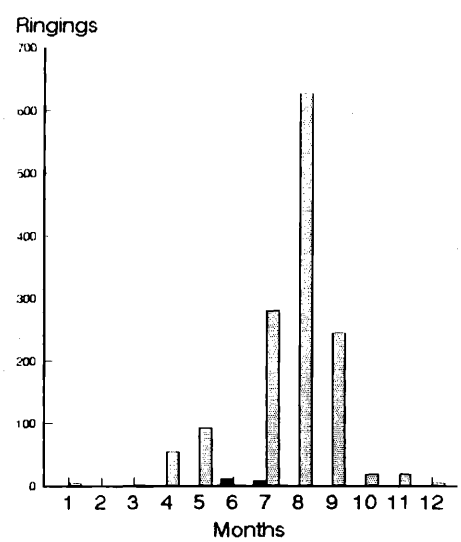

Figure 6. Seasonal pattern of ringing of chicks and fledglings/adults of Common Sandpiper *Actitis hypoleucos*.

■ Chicks ▢ Fledges

Figure 7. Ringing distribution in Spain.

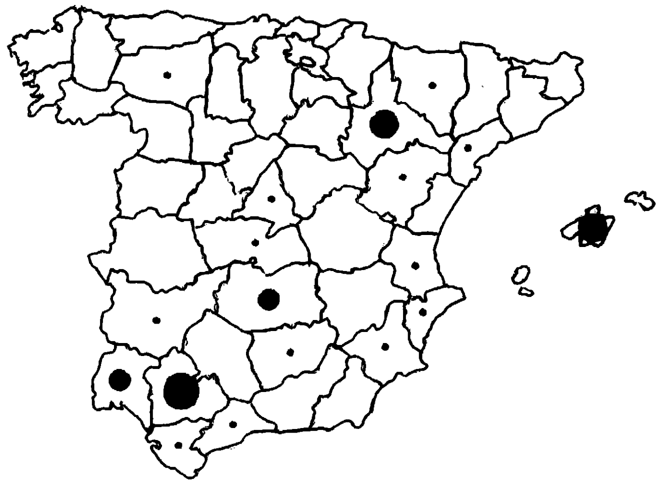

Figure 8. Ringing distribution of Black-winged Stilt *Himantopus himantopus*.

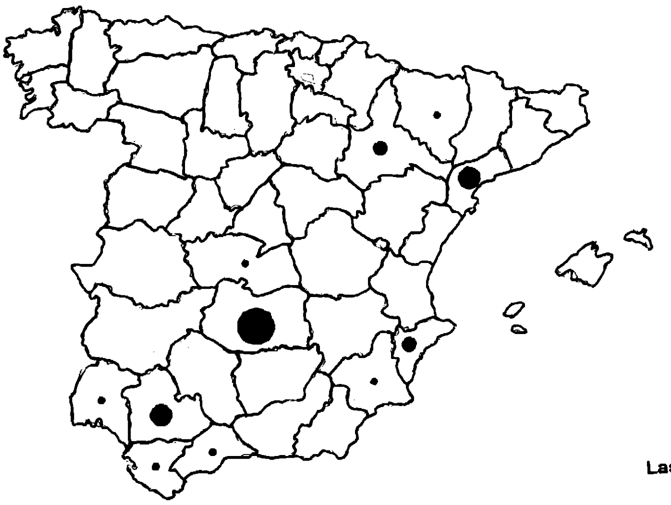

Figure 9. Ringing distribution of Avocet *Recurvirostra avosetta*.

Figure 10. Ringing distribution of Dunlin *Calidris alpina*.

Figure 11. Ringing distribution of Redshank *Tringa totanus*.

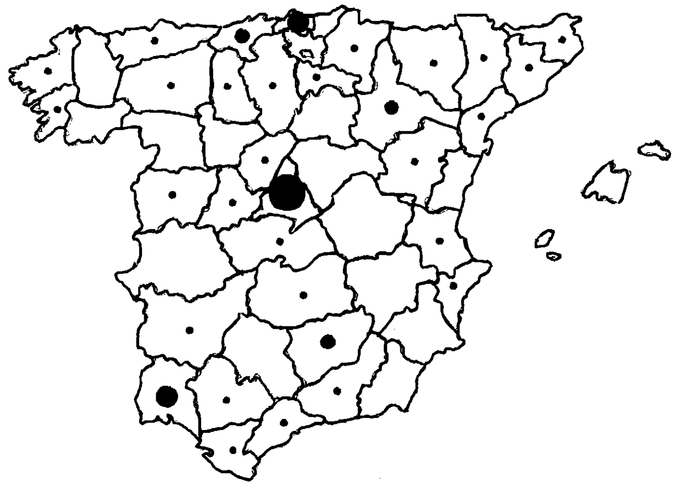

Figure 12. Ringing distribution of Common Sandpiper *Actitis hypoleucos*.

MONTHS OF YEAR	I		II		III		IV		V		VI		VII		VIII		IX		X		XI		XII		TOTAL		
	C.	F.	C.	F.	C.	F.	C.	F.	C.	F.	C.	F.	C.	F.	C.	F.	C.	F.	C.	F.	C.	F.	C.	F.	C.	F.	T.
Haemantopus ostralegus							17		15				1			4				5					33	9	42
Himantopus himantopus						7		25	133	47	1289	36	201	82	3	46		19		2					1626	264	1890
Recurvirostra avosetta						2			291	26	396	4	180	29	1	4		1		1					868	67	935
Burhinus oedicnemus		1		2		1		2	2	1	10	1	5	3	10	7	1	6				1			28	25	53
Cursorius cursor																1										1	1
Glareola pratincola								2	56	4	144	6	22	109	5	35		9							227	165	392
Charadrius morinellus								3								5		12		2						22	22
Charadrius dubius		2		1		17		36	9	10	19	2	26	37	2	118		111		4		4			56	342	398
Charadrius hiaticula		4		6		14		19	5	14		4		1	3	26		99		63		35			8	285	293
Charadrius alexandrinus		7		4		12	3	37	51	22	116	10	94	22	12	75		71		17		5			276	282	558
Pluvialis apricaria		1		1		1				1														1		5	5
Pluvialis squatarola		3		11		3		3										1		6		21		9		57	57
Vanellus vanellus		23		13		2		2	53	3	66	2	15	5		4				3		37		3	134	97	231
Calidris canutus				1						7		2						147		13		13		4		187	187
Calidris alba				18				16		1						2		22		27		37		2		125	125
Calidris minuta						18		1						9		57		23		32		8				148	148
Calidris temminkii																7		2								9	9
Calidris ferruginea				4		2		6						2		10		102		8		32				166	166
Calidris alpina		15		39		32		52		32				1		103		595		109		98		42		1118	1118
Philomachus pugnax		4		23		47		96		10				19		23		34		9		5		2		272	272
Lymnochryptes minimus		3		3		2		1												1		3		2		15	15
Scolopax rusticola																14		55		56		98		82		305	305
Gallinago gallinago		77		124		31		12		1										1		1		1		248	248
Limosa limosa		1		3		13		1		2		2		24		19		4		6		2		2		79	79
Limosa lapponica				1						2				1				31		9		1		2		47	47
Numenius phaeopus		1						2								1										4	4
Numenius arquata				1				3										3						1		8	8
Tringa erythropus		1		1		1		3		1				8		22		8		2		5				52	52
Tringa totanus		4		26		104	1	142	14	117	93	302		156		181		126		57		24		18	108	1257	1365
Tringa stagnatilis						1		1								2		1								5	5
Tringa nebularia								1						1		7		10		5		4				28	28
Tringa ochropus				4		6		9		1				28		61		48		8		3		5		173	173
Tringa glareola		5		11		2		9		1				2		27		22		6						85	85
Actitis hypoleucos		4				1		54		92	10	2	7	279		625		244		18		18		5	17	1342	1359
Arenaria interpres								1		4						2		12		3						22	22

Table 1.- Monthly ringings with MADRID - MUSEO DE CIENCIAS rings. (C: chicks, F: fledges, T: total)

Total number of waders ringed 10697

Symbols key for Figures

General map	Species map
<100	<50
100-400	50-100
401-750	101-200
751-1000	201-400
>1000	>400

The lack of data is due to the limited attention paid to waders by Spanish ringers (Barbosa & Asensio 1990), although, in recent years, the number of waders ringed has increased considerably (Asensio 1990).

This lack of interest is due to the special techniques required to capture the birds and the low population densities of most wader species at most times of the year. In addition, the areas favoured by waders are generally different to those where ringing is carried out, which explains why so few birds of this group have been ringed to date.

This report provides an overview of the wader ringing activity in Spain during the period 1957-1984, and offers phenological and geographical data which may provide a better understanding of waders in Spain.

RINGING RESULTS

The number of waders ringed in the MADRID-MUSEO DE CIENCIAS scheme (Madrid-Sciences Museum) accounts for two thirds of waders ringed in Spain until 1984. The rings employed were no longer used officially after 1982. The data gathered cannot therefore be used to assess ringer activity in the last decade. It does, however, provide a useful guide to the seasonal and geographical distribution of ringing between 1957 and 1984.

We analysed ringing data from the scheme run by the Centro de Migraci6n de Aves de la Sociedad Española de Ornitología (Centre for the Study of Bird Migration of the Spanish Ornithological Society), taking into account the following information: species, age, month and location (province) of ringing. Table 1 shows the number of each wader species ringed in Spain between 1957 to 1984 under this scheme, showing the results by month and age of the birds when ringed. In total, 35 species were ringed, only four of which consisted of more than 1,000 individuals. The total number of waders ringed was 10,697.

The number of chicks and adults/fledglings ringed each month is shown in Figures 2 - 6 for the five species that were ringed in the greatest numbers (Black-winged Stilt *Himantopus himantopus*, Avocet *Recurvirostra avosetta*, Dunlin *Calidris alpina*, Redshank *Tringa totanus* and Common Sandpiper *Actitis hypoleucos*). Figure 1 provides the combined data for the remaining species.

Figure 7 shows the national distribution of ringed waders in Spain, by province, and indicating those areas most important for wader ringing. One must bear in mind however, that these results are biased due to the preferences of individual ringers and their geographic distribution. Finally, Figures 8 - 12 show the geographic distribution of ringing of the five species most ringed.

CONCLUSIONS

In view of the results, the greatest number of waders are found during the breeding season, between May and July, and during the autumn migration, including August and September (Figure 1).

The strong autumn migration stands out with respect to weak spring migration (as shown by Bernis (1962) for passerines) and the minor importance of wintering in Spain as well (Alberto & Velasco 1988).

The areas with the most ringing (Figure 7) coincide with the most important wintering areas (Alberto & Velasco 1988) and previously by Barbosa & Asensio (1990) as important for ringing.

However, in some areas ringing activity has notably increased (Ebro Delta, Valencia and other adjacent provinces), others on the other hand, have lost their importance for waders (La Mancha Húmeda).

The existence of wader concentrations in a few coastal localities, could make a continuous ringing study easy, providing information that will help to conserve waders and their habitats, which are threatened all over Europe and especially in Spain.

REFERENCES

Alberto, L.J. & Velasco, T. 1986. Censo nacional de limícolas. *La Garcilla* 66: 29-32.

Alberto, L.J. & Velasco, T. 1988. Limícolas invernantes en España. In: J.L. Tellería, (Ed.), *Invernada de aves en la Península Ibérica*. Monografía 1. SEO, Madrid.

Asensio, B. 1990. Informe sobre la campaña de anillamiento de aves en España. Año 1989. *Ecología* 4: 239-295.

Asensio, B. & Carrascal, L.M. 1987. Migratología de las Agachadizas Comunes (*Gallinago gallinago* L.) invernantes en la Península Iberíca. *Ardeola* 34: 225-242.

Barbosa, A. & Asensio, B. 1990. Ringing waders in Spain: the current situation. *Wader Study Group Bull.* 59: 30-32.

Bernis, F. 1962. Sobre la migración de nuestros passeriformes transaharianos. *Ardeola* 8: 41-121.

Bernis, F. 1966. *Aves migradoras ibéricas*. Fasc. 4. SEO. Madrid.

Cordero-Tapia, P.J. & López de Villar, P. 1985. Fenología de limícolas en un pequeño río litoral Mediterráneo - El Tordera - (NE de España). *Ardeola* 32: 131-136.

Domínguez, J., Barcena, F., Souza, J.A. & Villarina, A. 1987. Breeding waders in Galicia, northwestern Spain. *Wader Study Group Bull.* 50: 28-29.

Martínez-Vilalta, A. 1985a. Breeding waders of the Iberian Peninsula. *Wader Study Group Bull.* 45: 35-36.

Martínez-Vilalta, A. 1985b. Descripción de la comunidad de limicolas invernantes en el Delta del Ebro. *Doñana Acta Vertebrata* 12: 221-229.

Martínez-Vilalta, A. 1991. Primer censo nacional de limícolas coloniales y Pagaza Piconegra, 1989. *Ecología* 5: 321-327.

Rubio, J.C. 1986. Estudio de la comunidad de limícolas de las Marismas del Odiel (Huelva). *Oxyura* III: 97-132.

Souza, J.A. 1978. Limícolas de Baldaio desde 1975. Reducción de presencia por drástica transformación del medio. *Braña* 2: 37-59.

Souza, J.A. & Domínguez, J. 1989. Efecitvos y distribución del Chorlitejo patinegro (*Charadrius alexandrinus*) en Galicia. *Ecología* 3: 305-311.

ERRATA

We apologise for the poor print quality of several of the figures in recent *Bulletins* and reproduce again, at larger scale some of the figures from Peter Reay and Sara McMahon's paper in *Bulletin* 71: 44-46.

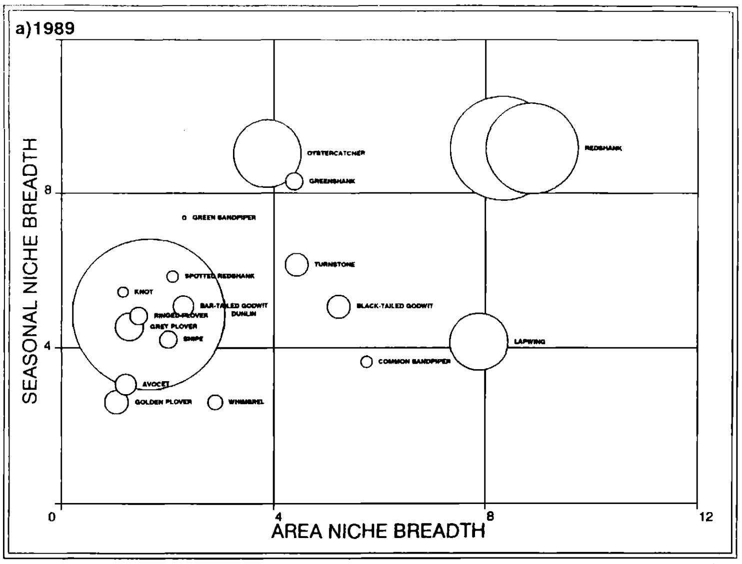

Figure 1a. Tamargram for the main wader species omn the Tamar Estuary Complex in 1989.

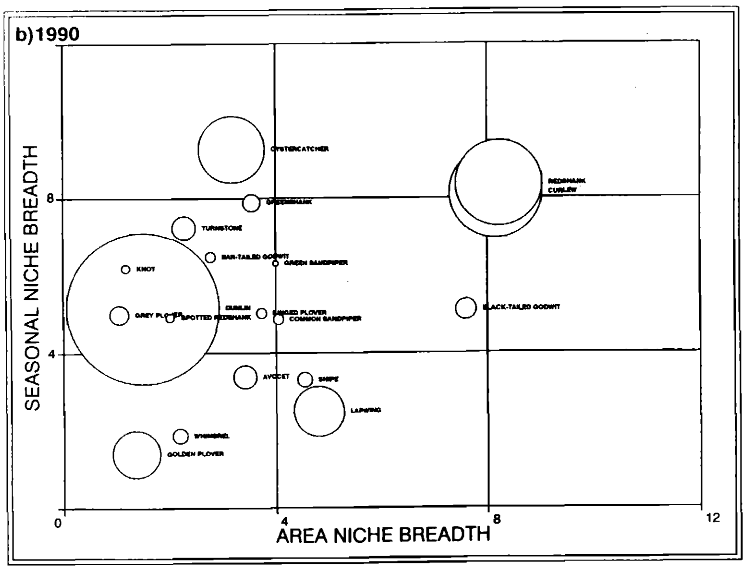

Figure 1b. Tamargram for the main wader species on the Tamar Estuary Complex in 1990.