FS11116	1J	23.6.80	Gwent, Wales 51 46'N 2 43'W	+ Morbihan, France	14 Sep 80
FV38174	3	27.9.80	Wellington, Salop	+ Manche, France 49 23'N 1 24'W	1 Nov 80
FV74362	3F	13.9.80	Wellington, Salop	+ Saltfleet, Lincolnshire 53 26'N 0 10'E	18 Nov 80
FV45956	4	18.8.78	Wash 52 48'N 0 18'E	+ Peterstone Wentlodge, Severn 51 30'N 3 4'W	29 Nov 80
SS23893	4	30.7.67	Skokholm, Dyfed 51 42'N 5 16'W	+ Dale Roads, Dyfed 51 42'N 5 10'W	1 Dec 80
GP16898	4	11.3.69	Skokholm, Dyfed	+ Dale Roads, Dyfed	6 Jan 81
FS82198	4	15.9.74	Bangor, Gwynedd, Wales	v Grangemouth, Firth of Forth 56 3'N 3 44'W	18 Feb 81

Redshank Tringa totanus

Others: less than 1,000 days 21, 1,000 - 1,999 days 4, 2,000 - 2,999 days 1.

DS37499	4	25.8.68	Wash 52 51'N 0 27'E	v Wash 52 53'N 0 28'E	28 Jan 79
CE91112	3	12.9.79	Rochester, Kent 51 21'N 0 44'E	+ Somme, France 50 16'N 1 59'E	14 Jan 80
CK50544	4	15.3.71	Dartford, Kent 51 28'N 0 30'E	v Dartford, Kent	26 Jan 80
DR28843	3	10.8.75	Wash 52 48'N 0 18'E	v Severn 51 19'N 3 0'W	16 Feb 80
DR08845	3J	23.8.78	Portsmouth, Hampshire	v Vendee, France	14 May 80
DS64759	2	19.12.76	Bangor, Gwynedd, Wales	x Middleton-in-Teesdale, Durham 54 38'N 2 4'W	16 Mar 80
DR44060	5	5.5.79	San Tin, Hong Kong 22 30'N 114 5'E	? Guangdong Province, China 22 15'N 112 47'E	27 Apr 80
DS66741	4	17.8.74	Wash 52 48'N 0 18'E	v Glen Esk, Tayside 56 51'N 2 41'W	7 May 80
DR67662	6	2.3.80	Severn 51 25'N 2 53'W	v Ribble Marshes, Lancashire 53 42'N 2 57'W	27 May 80
DR11710	4	2.12.78	Severn 51 34'N 2 48'W	v Ribble Marshes	29 May 80
DR70799	4	13.8.79	Invergordon, Highland Region	x Myrasysla, Iceland 64 35'N 22 15'W	30 May 80
DS80883	3	25.9.79	Bardsey Island, Gwynedd, Wales	v Ribble Marshes	4 Jun 80
DR07217	3	16.8.74	Orford, Suffolk	x Hunavaths, Iceland 65 28'N 20 20'W	3 Jul 80
DR85499	6	4.4.80	Findhorn Bay, Grampian Region	x Blonduos, Iceland 65 34'N 20 17'W	8 Jul 80
DR97332	1	25.5.80	Ribble Marshes	+ Harfleur, Seine-Maritime, France 49 30'N 0 22'E	31 Jul 80
DR22764	4	4.11.78	Wirral, Merseyside	x Strathclyde, Scotland	5 Aug 80
DR21711	4	26.7.75	Padstow, Cornwall 50 33'N 4 56'W	v Camel Estuary, Cornwall	25 Aug 80
DR21711	4	19.6.78	Banks Marsh, Ribble 53 42'N 2 55'W	v Camel Estuary, Cornwall	25 Aug 80
DR30895	4	16.8.78	Seal Sands, Teesmouth	v Camel Estuary, Cornwall	25 Aug 80
DR36246	4	3.6.76	Banks Marsh, Ribble	x Swansea, Severn 51 40'N 4 3'W	20 Sep 80
DR73100	3	23.9.79	Newburgh, Grampian Region	v Wash 53 0'N 0 9'E	29 Sep 80
DR38265	1	12.6.77	Dunnet Head, Highland Region 58 40'N 3 22'W	x Sunderland, Tyne & Wear 54 55'N 1 24'W	5 Dec 80
DR32499	4	27.8.76	Wash 53 0'N 0 7'E	v Saltburn, Cleveland	14 Feb 81

Green Sandpiper Tringa ochropus

CR63312	2	26.10.69	Dartford, Kent	v Swanscombe Marsh, Kent 51 27'N 0 18'E	24 Jan 81

Common Sandpiper Tringa hypoleucos

BV06572	4	15.7.78	Thurlestone, Devon 50 16'N 3 51'W	x Comrie, Tayside 56 21'N 4 0'W	18 May 80
BV64395	3	2.8.80	Weymouth, Dorset	? Mediouna, Casablanca, Morocco 33 27'N 7 31'W	26 Aug 80

Turnstone Arenaria interpres

1,000 days 10, 1,000 - 1,999 days 0, 2,000 - 2,999 days 2, 3,000 - 3,999 days 4, 4,000 - 4,999 days 11. All except 2 of the 3,000+ days recoveries were caught and retrapped at the Wash, the remaining two were caught and found dead on the Wash.

CE11213	4M	24.3.79	Colwyn Bay, Clwyd 53 19'N 3 45'W	v Musselburgh, Lothian Region 55 57'N 3 3'W	2 May 80
CE12092	3	10.11.79	Rhos-on-Sea, Clwyd 53 18'N 3 45'W	v Barrow-in-Furness, Cumbria	30 Aug 80
CE12092	3	4.4.80	Seaforth 53 28'N 3 1'W	v Barrow-in-Furness, Cumbria	30 Aug 80
CE12360	3	10.11.79	Rhos-on-Sea, Clwyd	v Barrow-in-Furness, Cumbria	30 Aug 80
CC70586	6F	12.5.79	Annan, Dumfries & Galloway	+ Cadiz, Spain 36 36'N 6 14'W	27 Sep 80
CC70596	6F	12.5.79	Annan, Solway Firth	v Barrow-in-Furness, Cumria	23 Nov 80
CC99040	6	9.8.75	Wash 52 51'N 0 27'E	v Monrovia, Liberia 6 20'N 10 46'W	25 Jan 81

RESULTS OF THE CENSUS OF EBRO DELTA WADER POPULATION, MARCH 1979 - FEBRUARY 1980

by A. Motis, A. Martinez, E. Matheu and F. Llimona

Introduction

During 1979 and the beginning of 1980, a programme of study of the wader population in the Delta de l'Ebre, Tarragona, Spain, (Fig.1) was carried out. This work is intended to contribute a better knowledge about the status of the waders in the Iberian Mediterranean area, which has been hardly studied until now. This paper can be considered as preliminary report of the results of this programme.

Method

Monthly censuses have been carried out with the purpose of evaluating the total population of waders of the Delta (Table 1); these have been accompanied by various observations during the whole year.

The Delta region is a complex system of lagoons, extensive areas of rice-fields, beaches and bays of shallow water. The census has been carried out by using a standard route which surrounds the main part suitable for waders and counting all birds observed, using binoculars and telescopes.

Most of the waders were counted in roosts (Fig.2), although in some areas the census is based on the concentrations in feeding areas.

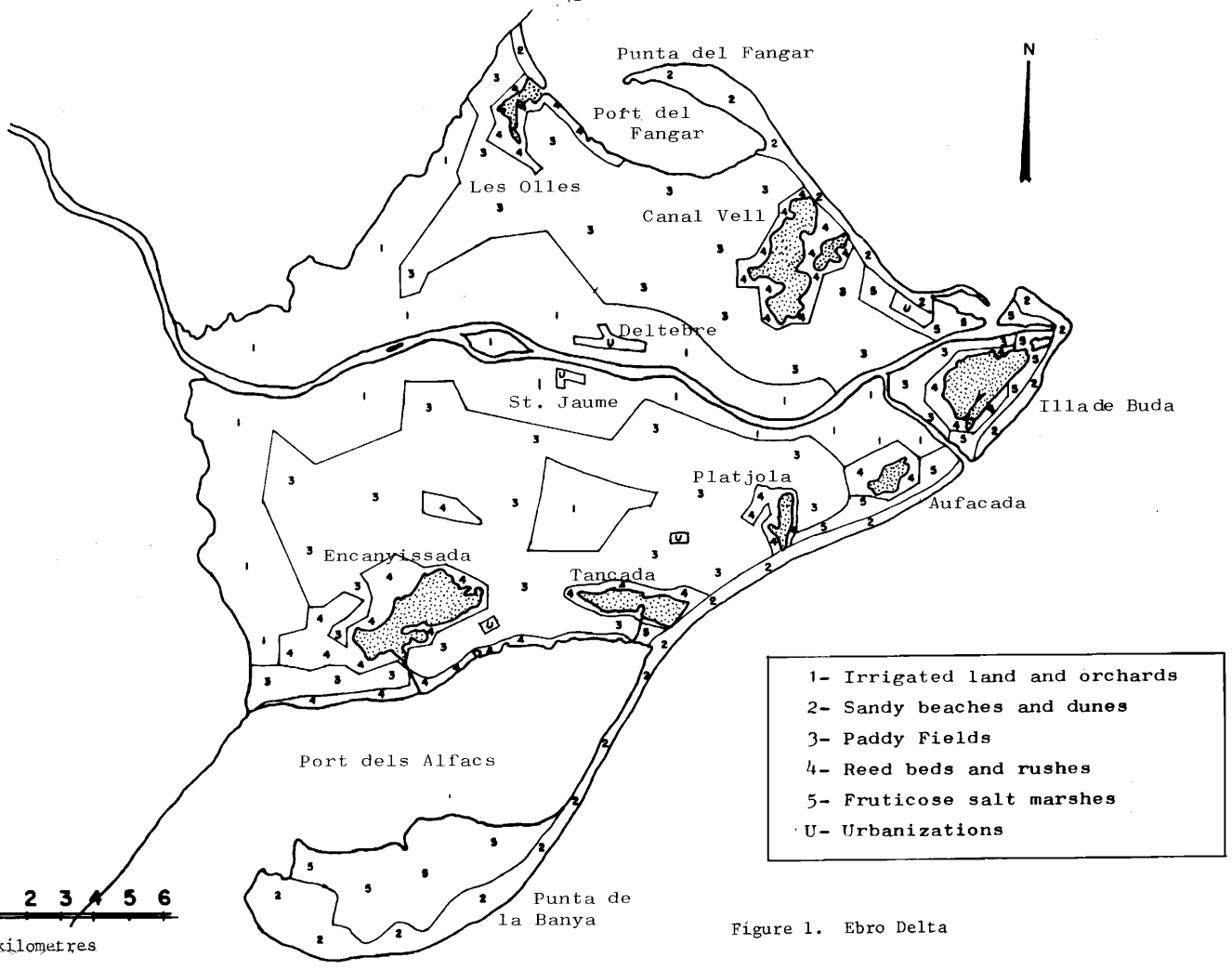

Figure 1. Ebro Delta

		03.79	04.79	05.79	06.79	07.79	08.79	09.79	10.79	11.79	12.79	01.80	02.80
Haematopus ostralegus	Oystercatcher	20	22	77	7	27	6	.	.	.	4	1	.
Himantopus himantopus	Black-winged Stilt	70	242	401	322	403	485	18	2	.	.	.	.
Recurvirostra avosetta	Avocet	396	379	436	416	563	582	552	333	324	221	225	275
Glareola pratincola	Collared Pratincole	1+	1+	88	91	78	65	1	1	.	.	.	.
Charadrius dubius	Little Ringed Plover	5	5	26	1	12	11	91	.	1	10	.	.
Charadrius hiaticula	Ringed Plover	2	11	167	.	2	2	54	73	.	37	65	.
Charadrius alexandrinus	Kentish Plover	107	794	1167	1026	2163	1072	574	67	71	70	50	44
Charadrius sp		.	.	30	.	.	.	.	.	9	.	.	.
Pluvialis apricaria	Golden Plover	.	.	.	.	.	.	.	45	1	.	1250	331
Pluvialis squatarola	Grey Plover	629	129	83	23	8	10	10	37	140	398	516	704
Vanellus vanellus	Lapwing	20	.	.	.	2	3	20	236	249	193	2102	540
Calidris canutus	Knot	3	.	12	.	.	4	1	.	.	.	.	.
Calidris alba	Sanderling	108	124	21	.	1	.	76	40	42	26	82	105
Calidris minuta	Little Stint	77	771	208	.	.	48	550	452	403	689	931	1087
Calidris temminckii	Temminck's Stint	.	.	.	.	.	.	.	1	1	.	.	.
Calidris ferruginea	Curlew Sandpiper	.	.	181	.	57	799	171	1	.	.	.	.
Calidris alpina	Dunlin	6503	2538	2	.	.	.	857	721	5028	8909	7782	8288
Calidris sp		.	.	20	.	.	.	.	.	40	.	100	.
Philomachus pugnax	Ruff	64	136	2	.	54	47	6	271	8	143	146	154
Lymnocryptes minimus	Jack Snipe	.	.	.	.	.	.	.	.	.	.	.	.
Gallinago gallinago	Snipe	12	.	.	.	.	.	125	1487	2630	3879	1116	750
Limosa limosa	Black-tailed Godwit	754	31	52	39	414	706	360	2640	1944	3697	2182	6992
Limosa lapponica	Bar-tailed Godwit	.	63	14	3	4	10	41	15	7	20	13	10
Numenius phaeopus	Whimbrel	.	1	.	.	20	12	9	.	.	.	.	.
Numenius arquata	Curlew	152	21	49	22	31	40	9	11	22	38	117	95
Tringa erythropus	Spotted Redshank	22	20	.	.	11	11	109	532	65	9	105	33
Tringa totanus	Redshank	1051	721	35	22	113	223	507	82	493	474	504	806
Tringa stagnatilis	Marsh Sandpiper	1	.	.	.	.	.	.	10	.	.	.	.
Tringa nebularia	Greenshank	4	23	.	.	8	6	17	3	51	6	6	4
Tringa ochropus	Green Sandpiper	.	4	2	.	2	3	3	14	3	5	.	1
Tringa glareola	Wood Sandpiper	.	1	7	1	132	418	150	.	2	6	2	1
Xenus cinereus	Terek Sandpiper	.	.	.	.	.	1	.	.	.	.	.	.
Actitis hypoleucos	Common Sandpiper	.	.	12	1	7	8	8	4	1	1	1	.
Arenaria interpres	Turnstone	1	.	.	1	2	.	1	.	2	5	3	5
Phalaropus lobatus	Red-necked Phalarope	.	.	.	.	.	.	.	1	.	.	.	.
TOTAL:		10002	6037	3092	1975	4114	4572	4320	7079	11537	18840	17299	20225

Table 1. Wader census of the Ebro Delta, March 1979 - February 1980.

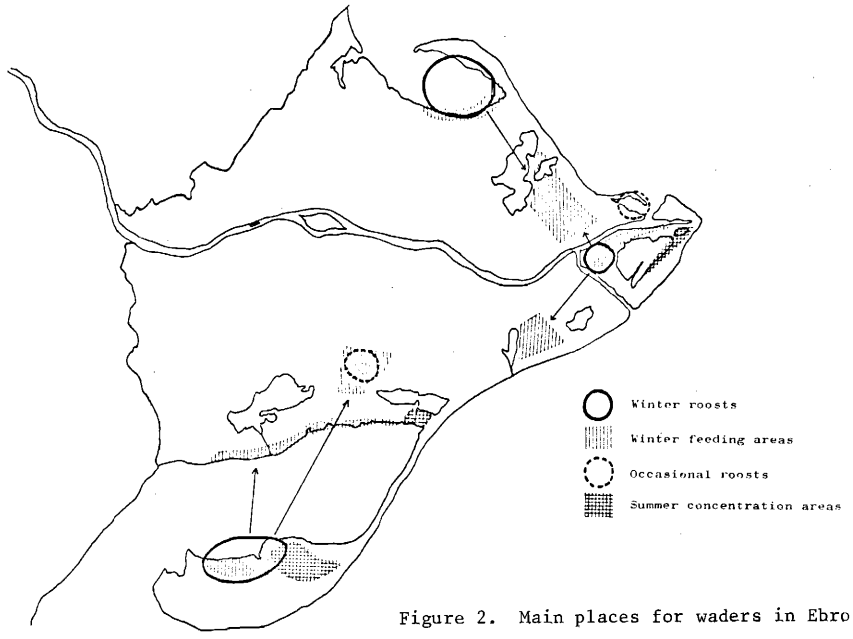

Figure 2. Main places for waders in Ebro Delta

The large extent of rice-fields in the Delta makes the census more difficult in months during which rice-fields are appropriate for waders (mainly in autumn and winter) due to the dispersion of the big concentrations. The method of the census results in different precision for different groups of species. The census is very precise for species which form large concentrations and live in relatively constant areas. For those which use areas like beaches, such as Sanderling, Oystercatcher and Turnstone, the census results incompete as the itinerary does not cover the total area adequately for these species.The census is hardly representative for the species which distribute themselves irregularly over the whole area of the rice-fields, like the Lapwing, Golden Plover and especially in the case of Common Snipe for which the census used does not prove very valuable. The Snipe is a very common bird in autumn and winter, when the rice-fields are still flooded, but due to the difficulty in seeing them the census underestimates their real numbers. For example, during the winter of 1979-80 3000 snipes were shot in only one part of the Delta (X. Ferrer, pers. comm.). Another group of species counted rather insatisfactorily are the breeding birds: Oystercatcher, Avocet, Black-winged Stilt, Pratincole, Kentish Plover and Redshank during their breeding season, due to the difficulties in locating these birds in this period.

Characteristics which have influence to the population of the waders and their distribution in the Delta region

The two main aspects which have influence to the distribution of the waders through the year in the Delta are: the annual cycle of the rice and the oscillation of the water level in the two bays.

In the Ebro Delta the cultivation of rice is the main factor which regulates the size and depth of the flooded area. In contrast in the other deltas of the Mediterranean region which are flooded directly by rivers, the volume of the river does not have any direct influence on the flooded surface of the Ebro Delta, because it is totally canalized. These canals drain into the sea or flood the rice-fields, where the water level is maintained artificially. For this reason the biggest flooded surface is in summer and the lowest in the winter months (Fig.3) - just opposite to the volume of the river (see Fig.4). Therefore the lagoons depend on the water contribution of the rice-fields (see Fig.3) and are highest in summer the same as the two bays (Alfacs and Fangar) which receive important water contributions in this period.

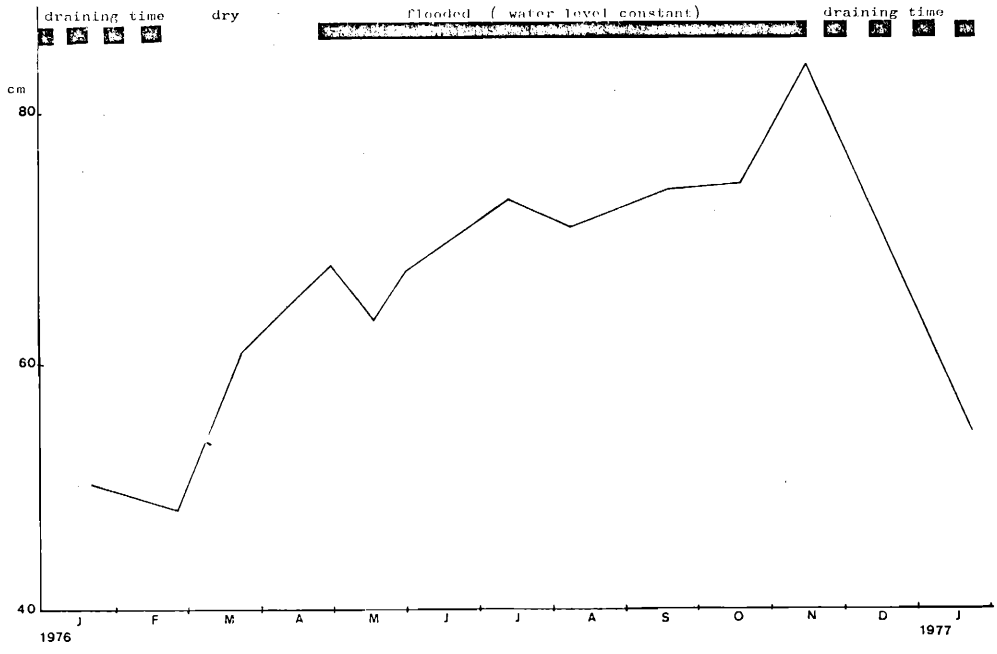

Figure 3. Oscillations of depth of water through the year. Upper thick line: ricefields. Lower line: water level of lagoons (Encanyissada). (Comin & Ferrer 1979).

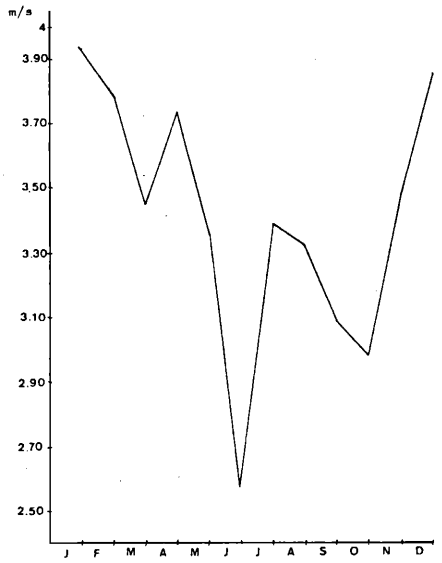

Figure 5. Mean wind speed (1945-1966). (Maldonado 1972)

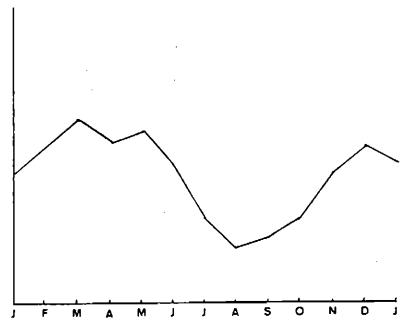

Figure 4. Oscillations of water level of the River Ebro. Maldonado 1972

The particular characteristics of rice cultivation make the fields only suitable for waders during the period of draining the fields, a slow process which takes place between November and February and which depends on the climatic conditions (specially of wind). In some areas this process is traditionally disturbed by hunting and fishing. Due to this certain areas still remain flooded till the middle of March. During the rest of the year the rice-fields are not used by these birds, becuase they are dried out or because they are too deep (about 30 cm) during the growth of the rice (April-October). Overall one must not forget that the Delta region is an area with high human pressure, and local changes of the general situation are always possible.

The effect of the tide is insignificant in the Mediterranean areas and the two bays only play an important role in the winter months, when the water level is lowest, due to the high frequency of seiches (long wavelength waves generated in anticyclonic conditions or after strong winds) during this period of year (Fig.5). In this time the higher intensity of winds opens large expanses of mud grounds, which are very rich in food. It is in some ways similar to the effect of the tides. All these factors mentioned combine during the whole year to give some special characteristics to the dynamics of the waders in the Delta.
During the winter months the bays are used as roosting places by the great majority of species and the feeding areas are distributed between these bays and the rice-fields. Only Golden Plover, Lapwing, Snipe and Black-tailed Godwit always remain in the rice-fields. Very few species (Oystercatcher, Sanderling and Turnstone) never use the rice-fields. From the beginning of April and during the summer the breeding species occupy the salt plains and the marshland as well as the beaches. During this period the migrant birds concentrate on the same spots, mainly the salt-plains. At the beginning of autumn the situation is similar until November when the rice-fields are being drained and thus become important again for waders.

Comment

The characteristic of this annual cycle which is to be emphasized is the great poverty of spring migrants in comparison to our observations of other years. This has mainly affected the numbers of Ringed Plover, Knot and Sanderling.

As can be seen from the material presented above, the Ebro Delta acquires its main importance as a winter resort, being one of the most important Mediterranean areas in this respect. In contrast to that its interest as resting place for migrant birds is low.

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