

An update on wintering waders in coastal Italy

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The results of recent counts of waders wintering on Italian coastal wetlands are presented. Three times more Dunlin *Calidris alpina* than reported in previous overviews were found (47 000, with fluctuations in totals between years of 32 500 and 68 500). A total of up to 120 000 waders was found. Three sites (Lagoon of Grado-Marano, Lagoon of Venice and Gulf of Manfredonia) are internationally important for Dunlin, Avocet *Recurvirostra avosetta* and possibly Kentish Plover *Charadrius alexandrinus*, according to 1% thresholds.

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INTRODUCTION

A reorganization of the International Waterfowl Census data from Italy is currently being carried out by INFS. As well as providing a complete scan of recent local literature, this initiative has given the opportunity to present new and relatively complete figures on waders wintering on Italian coastal wetlands. These data are useful in contributing to a more general update of wader population size in the Mediterranean, which is presently known mainly on the basis of information collected in the mid-1980s (Smit 1986; Smit & Piersma 1989).

DETAILS ON AREAS AND COUNTS

Figure 1 shows the location of all the areas described. These do not cover all of the 9,000 km of the Italian coastline, as some parts lack suitable habitats. Some minor wader concentrations might occur at the small estuaries of Calabria and Campania, for which we have no precise information. We estimate, however, that coastal waders at all uncovered areas do not exceed a total of 1 000 birds. The data presented refer to coastal areas, including sites up to 10 km inland. All counts were made around mid-January. Information on the amplitude of spring tides is given only for tidal wetlands.

GRADO: Lagoon of Grado-Marano (ca. 17,000 ha), Isonzo mouth and northernmost Adriatic seashores, with offshore sandbanks. Average spring tide range: 90 cm. The area includes two Ramsar sites (total 1 650 ha) and some no-shooting sites. Data given is from 1991 (Baccetti *et al.* 1992), 1994, 1995 and 1996. Counts were made by 'Osservatori Faunistici' of Friuli - Venezia Giulia.

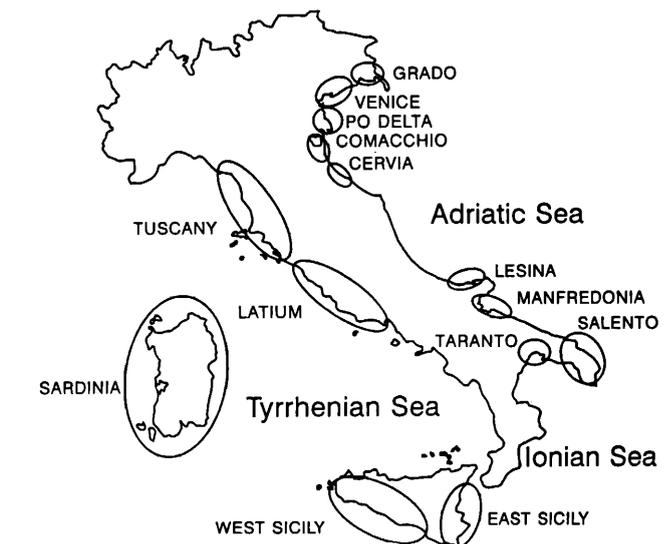


Figure 1. Map of Italy showing the different counted areas.

VENICE: Lagoon of Venice (ca. 50,000 ha, of which 9 000 is dammed and non-tidal) and Lagoon of Caorle (ca. 2 000 ha, almost entirely dammed), with adjacent sandy seashores. Average spring tide range: 90 cm. Most of the territory is unprotected. One small Ramsar site is present (200 ha). Data given is from 1993-1996 (INFS data bank: counts by INFS, Associazione Faunisti Veneti and Amministrazione Provinciale di Venezia).

PO DELTA: Lagoons and active branches of the Po river, with offshore sandbanks and shallows. Average spring tide range: 80 cm. Most marshlands between river branches now claimed or converted into dammed lagoons. Areas suitable for coastal waders presently cover hardly more than 5 000 ha and hunting pressure is causing a further restriction to these areas. Despite the

Table 1. Wader totals in Italy.

	Heeos	Himhi	Recav	Buroe	Pluap	Plusq	Chahi	Chadu	Chaal	Vanva	Gaiga	Lymmj	Limil	Numar	Trier	Trito	Trine	Trioc	Acthy	Arein	Caica	Calaa	Calmi	Calte	Caial	Phipu	Total	
GRADO	med (4)				14	897			18	260	+	1	0	672	0	340	3	1	20	1	0	1	0	0	15243		17471	
	min		0	0	0	750			11	79		0	0	476	0	194	0	0	10	0	0	0	0	0	12465		13985	
	max		3	3	30	1073			48	454		11	1	746	8	450	14	4	26	4	2	3	4	0	21500		24381	
VENICE	med (4)		59	0	0	254	6	99	207	94	0	0	397	36	321	4	0	0	8	0	0	0	77	0	18285	0	19847	
	min		0	0	0	8	4	60	8	26	0	0	298	1	284	0	0	0	7	0	0	0	1	0	10950	0	11647	
	max		115	352	290	12	121	5003	161	1	720	79	397	19	2	14	1	2	14	1	1	2	190	0	23123	20	30622	
PO DELTA	10		112	50	335	5	56	712	71	1	132	1	1	1	2	9	3	74	22	116	1700	3411						
COMACCHIO	med (3)		0	110						20	1	41	5	0	0	0	0	0	0	3	0	0	27	0	70	1	278	
	min		0	97						0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	99	
	max		1	116						300	23	64	40	21	1	1	1	5	164	164	1200	3	1939					
CERVIA	med (6)		328	0	3	3	35	23	0	0	0	0	0	0	56	0	0	0	1	1	0	71	0	3838	46	4401		
	min		181	0	0	0	6	9	0	0	0	0	0	0	14	0	0	0	0	0	0	12	0	2070	19	2311		
	max		486	1	38	38	61	765	7	1	129	1	1	1	129	3	3	2	2	2	2	201	0	5302	80	7077		
TUSCANY	med (6)	0	59	26	151	29	4	0	25	2623	228	1	1	131	67	232	0	0	8	1	0	0	17	0	905	1	4509	
	min	0	27	16	134	15	2	0	15	1535	126	0	0	82	29	164	0	0	3	0	0	0	5	0	414	0	2567	
	max	1	107	32	303	43	12	1	45	5053	557	3	3	252	182	292	5	5	34	3	7	47	4	1259	3	8248		
LATIUM	med (9)		1	0	217	15	0	1	14	2366	+	+	0	44	2	5	0	0	13	0	0	0	17	0	263	5	2963	
	min		0	0	138	3	0	0	8	1835			0	7	0	0	0	0	0	9	0	0	0	0	145	0	2145	
	max		12	1	400	51	5	4	60	4000			6	90	15	20	1	2	43	1	1	10	102	0	720	10	5554	
LESINA	med (3)								29	0								1	2	0	15	0			41	88		
	min								24	0								0	0	0	14	0			0	38		
	max								48	6								2	2		34				68	160		
MANFREDONIA	med (4)		2423	0	106	0	201	26	1	52	198	61	348	3	4	0	0	0	4	0	0	350	0	3088	8	6869		
	min		732	0	24	0	129	19	0	15	85	13	225	1	3	0	0	0	3	0	0	89	0	2416	0	3751		
	max		4770	3	195	1	706	72	6	75	350	95	791	8	6	1	1034	1	6	6	1	1034	0	9186	17	17316		
SALENTO	med (4)		0	140	7	7	22	542	5	10	10	10	10	10	10	10	10	0	0	0	0	1	0	278	1	1015		
	min		0	0	2	2	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	47	69		
	max		3	520	8	8	40	828	38	22	22	13	13	13	4	4	4	4	4	4	4	33	0	370	0	1879		
TARANTO	1990								3	2	12					1					1				12	31		
EAST SICILY	med (6)		0	13	1	203	7	5	1	123	548		1	27	21	73	3	18	1	18	1	20	93	0	100	8	1266	
	min		0	1	0	106	4	0	0	75	225		0	15	2	25	0	0	0	0	0	4	20	0	51	0	528	
	max		3	81	50	450	11	13	4	200	750		3	47	170	96	35	35	2	2	2	30	350	1	192	19	2507	
WEST SICILY	1992																											
	med (3)		0	187	1002	11	169	102	50	21	2140	3224	177	0	16	256	294	661	51	73	24	0	25	1560	1	2338	8	12361
	min		0	179	810	4	60	72	32	7	1288	2223	143	0	2	97	183	585	20	0	5	0	11	1089	0	1197	6	8062
SARDINIA	max	7	211	1251	78	209	130	74	53	2250	5148	277	1	37	260	399	872	74	1	79	34	11	41	2240	2	2898	12	16649
	med	10	187	4247	38	944	1755	88	26	2934	10557	569	3	70	1959	543	2079	92	5	165	30	74	84	2489	1	47154	79	76202
	min	10	179	2100	20	488	1213	61	10	1864	6651	378	1	17	1243	244	1566	49	2	97	8	74	52	1502	0	32460	27	50316
Total	max	18	215	7196	161	2318	2174	140	65	3807	23097	1152	17	126	2735	1118	3041	188	14	230	48	91	148	4651	7	68523	166	121446

Table 1. Wader totals in Italy. For each species and area, median number of birds, number of years on which the median was calculated, max/min numbers of birds are indicated. For rare species, see text. + = present but not counted. Species acronyms: Haeos = Oystercatcher *Haematopus ostralegus*, Himhi = Black-winged Stilt *Himantopus himantopus*, Recav = Avocet *Recurvirostra avosetta*, Buroe = Stone Curlew *Burhinus oedicnemus*, Pluap = Golden Plover *Pluvialis apricaria*, Plusq = Grey Plover *P. squatarola*, Chahi = Ringed Plover *Charadrius hiaticula*, Chadu = Little Ringed Plover *C. dubius*, Chaal = Kentish Plover *C. alexandrinus*, Vanva = Lapwing *Vanellus vanellus*, Galga = Common Snipe *Gallinago gallinago*, Lymmi = Jack Snipe *Lymnocyptes minimus*, Limli = Black-tailed Godwit *Limosa limosa*, Numar = Curlew *Numenius arquata*, Trier = Spotted Redshank *Tringa erythropus*, Trito = Redshank *T. totanus*, Trine = Greenshank *T. nebularia*, Trioc = Green Sandpiper *T. ochropus*, Acthy = Common Sandpiper *Actitis hypoleucos*, Arein = Turnstone *Arenaria interpres*, Calca = Knot *Calidris canutus*, Calaa = Sanderling *C. alba*, Calmi = Little Stint *C. minuta*, Calte = Temminck's Stint *C. temminckii*, Calal = Dunlin *C. alpina*, Phipu = Ruff *Philomachus pugnax*.

Ramsar designation of 1 300 ha and creation of a National Park, most of the area cannot yet be considered adequately protected. The entire delta has been counted in recent years only in 1994 (INFS data bank: counts mainly by R. Tinarelli and R. Rusticali). For earlier counts, see Tinarelli (1989). These were not merged with 1994 data due to the increasing habitat degradation which has apparently reduced wader numbers.

COMACCHIO: Comacchio Lagoon (ca. 13 000 ha) and other large remains of the ancient Po Delta, between the Volano branch of the Po river and the city of Ravenna. The main tidal wetlands in this area are Reno mouth and the Pialasse marshlands by Ravenna (average spring tide range: 40 cm). Important wader places are to be found also at Comacchio Saline (518 ha) and the southern shore of Comacchio Lagoon. The four existing Ramsar sites cover a total area of about 18 500 ha and hunting is forbidden over a part of them. Recent counts date from 1993, 1994 and 1995 (INFS data bank: counts mainly by R. Tinarelli and P. Boldregghini).

CERVIA: Cervia Saline, with industrial salt-pans covering an area of 827 ha, is one of the few entirely protected wader resorts in northern Italy. Sandy seashores (ca. 2 km distant from this saline), Ortazzo former rice-fields and Bevano mouth are of minor importance for waders. Two Ramsar sites are present. The saline is regularly counted at least once per month since 1990 (Casini *et al.* 1992); January counts from 1991-96 were used for the present report.

TUSCANY: Coastal lakes, marshes and river mouths, most of them being at least partly protected and including four Ramsar sites. Waders are concentrated mainly in the southern part of the region, at Orbetello Lagoon, Ombrone mouth and other remains of the former Maremma marshes (ca. 5 000 ha in total). The years considered are 1991-1996 (INFS data bank: counts by Centro Ornitologico Toscano); *c.f.* also Arcamone *et al.* (1994).

LATIUM: Small coastal lakes and marshes scattered along more than 250 km of sandy coasts, including 5 small Ramsar sites. These are entirely protected. The lake complex of Laghi Pontini (1 100 ha, belonging to Circeo National Park) and Tarquinia Saline (135 ha) hold the largest wader numbers. Count data, from 1986-1991 and 1993-1995, were taken from Biondi *et al.* (1993) and Biondi & Pietrelli (1995).

LESINA: The coastal lakes of Lesina and Varano (respectively 5 100 and 6 100 ha), extremely important for several waterfowl species, offer little habitat for waders and suitable areas are further reduced by heavy hunting pressure. The adjacent sandy seashore, more than 30 km long and for a large extent well preserved, is one of the few Italian beaches regularly occupied by small numbers of Sanderlings *Calidris alba*. Counts shown here refer to years 1990, 1995 and 1996 (INFS data bank).

MANFREDONIA: A chain of wetlands encompassing 40 km of man-spoiled sandy beaches along the Gulf of Manfredonia, between Candelaro and Ofanto mouths. Margherita di Savoia Saline (protected) is the main wader area, with a total of 3 900 ha of industrial salt-pans and deeper seawater reservoirs. Large salt-scrubs and pastures bordering the saline are important for Curlews *Numenius arquata*. Counts were made by INFS in the period 1993-1996. The results of earlier counts were reported by Tinarelli & Baccetti (1991) and Baccetti *et al.* (1992).

SALENTO: A series of small wetlands around the southern Apulian coast, from Brindisi harbour to the Ionian seashore of Lecce province. The main wader sites are the former Brindisi Saline (long abandoned, partly converted into fish-farms in 1994) and the coastal marshes of Le Cesine and San Cataldo, both on the Adriatic coast. Counts shown in Table 1 are from 1990 (Baccetti *et al.* 1992) and 1994-1996 (INFS data bank: G. Marzano).

TARANTO: Sandy beaches along the Gulf of Taranto and Mar Grande, shores and marshland remains on the lagoon of Mar Piccolo. A former saline (1 000 ha) was entirely converted into arable land before the last war. There are no sites effectively protected from hunting. The area was only counted in 1990 (INFS data bank).

EAST SICILY: Coastal wetlands of the provinces of Catania and Siracusa. Small traditional salines (seven, all recently abandoned) and dune lakes represent the main wader habitats, together with the Simeto river mouth. A large freshwater reservoir (720 ha), created in 1991 in place of the famous Biviere di Lentini, claimed around 1950 (Ciaccio 1993), is also being used by waders. Hunting is forbidden at the main sites. Data shown in Table 1 (years: 1990-1995) were taken from Corso (1995), with additional data from the INFS data bank.

WEST SICILY: Small coastal marshes, river mouths and sandy beaches from the Gulf of Gela to the harbour of Mazara del Vallo, a large open lagoon (Stagnone di

Marsala, ca. 2 500 ha) surrounded by small traditional salines and another group of traditional salines at Trapani (ca. 800 ha), the latter now partly replaced by industrial salt pans. Most of Trapani and Marsala wetlands are protected from hunting. The only available count was made by some of us in 1992 and integrated by F. Lo Valvo.

SARDINIA: Despite lagoons and salt-marshes occur almost everywhere around the island, for a total surface exceeding 15 000 ha, the main wader places are to be found in the lagoons and salines near Cagliari, along the Gulf of Oristano and at Sant'Antioco salines. Complete waterbird counts, from which data presented here was taken, were carried out in 1993-1995 by IVRAM and Regione Sarda, under the co-ordination of Helmar Schenk.

COMMENTS ON SPECIES TOTALS

Table 1 shows the results of recent mid-January counts for each area and species, in the form of median, and min/max values recorded over a variable number of years according to locality (in the worst cases, just one year). The national totals of the bottom lines, being the sum of partial figures obtained from different groups of years, should be used with caution. Only Woodcock *Scolopax rusticola* has been excluded from the dataset for obvious ecological reasons.

For some irregular species, totals were not included in Table 1. Their min/max values per area, over the same years as for other species, are: Bar-tailed Godwit *Limosa lapponica* (Grado 0-3, Tuscany 0-1, Latium 0-9, Sardinia 0-5), Whimbrel *Numenius phaeopus* (Sardinia 0-7), Slender-billed Curlew *Numenius tenuirostris* (Manfredonia 0-7, up to 18 in February: *c.f.* Serra *et al.* 1995), Marsh Sandpiper *Tringa stagnatilis* (Tuscany 0-1, Sardinia 0-2), Wood Sandpiper *Tringa glareola* (Latium 0-2, Sardinia 0-2), Red-necked Phalarope *Phalaropus lobatus* (Manfredonia 0-1), Curlew Sandpiper *Calidris ferruginea* (Latium 0-6).

For wader species occurring also inland, coastal totals represent only a partial figure, although possibly not an irrelevant one for Lapwing *Vanellus vanellus* and Golden Plover *Pluvialis apricaria*. This is not the case of Green Sandpiper *Tringa ochropus*, seldom recorded on the coast. Cryptic species like snipes were of course censused in an unsatisfactory way, but in areas where counts are largely carried out on foot, covering similar routes in different years (Tuscany), totals may well reflect the real variations of abundance. A particular comment is probably necessary for the high number of Little Ringed Plovers *Charadrius dubius* in Sardinia, which may partly be due to misidentification: this risk does not affect, however, all the sightings and on the other hand Sardinia stands out also for other 'southern' species, like Black-winged Stilt *Himantopus himantopus* and Greenshank *Tringa nebularia*.

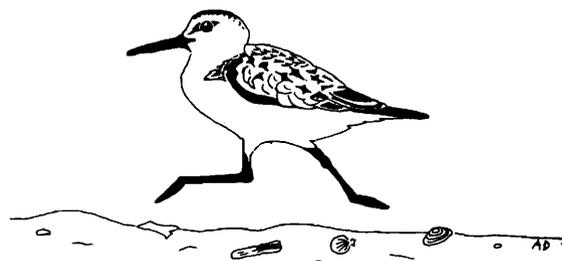
Compared with previously available national figures (Smit 1986; Smit & Piersma 1989), much higher totals were obtained for Dunlin *Calidris alpina* (47 154 vs. 15 500) and much lower ones for Little Stint *Calidris minuta* (2 489 vs. 12 500): this is apparently due to the improved quality of counts at north Adriatic key-sites (*c.f.* Perco 1984). Avocet *Recurvirostra avosetta* also turned out to be present in larger numbers, because of a probable population increase and a better coverage of Manfredonia area. Curlew, Redshank *Tringa totanus* and Greenshank had probably been over-estimated in the past. Some of these differences were already stressed in an earlier update, attempted by Tinarelli & Baccetti (1991) for a smaller number of years.

From data presented here, on individual sites, a few clear indications of international importance can be obtained. Using the data of Rose & Scott (1994), Italian wetlands holding more than 1% of selected flyway wader populations are the Lagoon of Grado and Marano and the Lagoon of Venice for Dunlin, the Gulf of Manfredonia for Avocet and, at least in one year, Kentish Plover *Charadrius alexandrinus*. The last two species would also reach the 1% threshold over the complex of Sardinian wetlands.

The distribution of waders within Italy shows that coastal species are mainly present along the tidal sector of our coast (*i.e.* from Grado area south to Comacchio). Here more than 35 000 Dunlin, 1 400 Grey Plover *Pluvialis squatarola* and 1 200 Curlew are regularly present, implying that this is probably the second important wintering area of the Mediterranean for coastal waders. Salines represent the main wader habitat in the rest of the country and account for 10 000 more Dunlin at Cervia, Manfredonia and Sardinia, as well as important figures of Avocet, Kentish Plover and Little Stint. While most Italian salines are protected, hunting appears to be an important limiting factor on natural wetlands almost all over the country, also preventing the occupation of several potential sites (*c.f.* Table 1, Lesina and Taranto).

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Pre- and non-breeding biology of Dotterel *Charadrius morinellus* on Värriötunturi fell area, NE Finland

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Pulliainen, E. & Saari, L. 1996. Pre- and non-breeding biology of Dotterel *Charadrius morinellus* on Värriötunturi fell area, NE Finland. *Wader Study Group Bull.* 81: 54-58.

The pre- and non-breeding biology of the Dotterel *Charadrius morinellus* was studied mainly in 1969-1973 in the Värriötunturi fell area (67°44' N, 29°37' E), NE Finland. Dotterel arrived in late May apparently already paired and copulations were concentrated into a short period in late May-early June. No "mating areas" were observed and fights recorded were mostly between neighbouring pairs meeting on the alpine heath. Territoriality was weak, the function of the fights was probably spacing out of nests. Females usually seemed to leave the study area after the completion of clutches and consequently few display flights were recorded.

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INTRODUCTION

The pre-breeding biology of Dotterel *Charadrius morinellus* is not well known. We define the pre-breeding season as the time between arrival and the start of egg-laying. Summaries of pre-breeding behaviour are given by Nethersole-Thompson (1973), Glutz von Blotzheim *et al.* (1975), Cramp & Simmons (1983) and Owens *et al.* (1994, 1995). Accounts of Dotterel territoriality differ. Even less well known is the non-breeding biology that we here apply to everything done by the Dotterel on the breeding grounds after the pre-breeding period that is not laying, incubation or chick rearing. The existence of non-breeders, prospecting for new mates, summer flocking *etc.* fall under this heading, as does autumn flocking and

departure. Of necessity this is a mainly descriptive account describing some basic behavioural traits in order to facilitate future, more detailed studies.

METHODS

Most of the data was collected on the Värriötunturi fell (67°44' N, 29°37' E) during an intensive Dotterel study period in 1969-1973, with further data for the whole study period 1968-1990 (see Pulliainen & Saari 1992). In 1969-1973 the study area was visited daily from the arrival of Dotterel throughout the breeding season.