

BREEDING WADERS IN ITALY

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This review is an attempt to summarize recent data concerning the distribution and population size of breeding waders in Italy. Despite a very incomplete picture of the numerical situation of the commonest waders (Little Ringed Plover, Common Sandpiper), the numbers found for species like the Black-winged Stilt and Kentish Plover appear to be important in a European context. Co-ordinated research has been started with the aim of filling the major gaps within the next few years.

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INTRODUCTION

The distribution and number of breeding waders are now known for many European countries (Piersma 1986, Bartovsky et al. 1987). In this paper we have collected the available information concerning Italy. This allows wider use of this material, and also focusses on the major gaps.

To do this, we have checked the whole Italian literature since 1978. This comprises scattered reports on some species, a national enquiry about a single species, the Black-winged Stilt *Himantopus himantopus* (Tinarelli 1985b, unpubl.), unpublished data taken from the Atlas Project (Meschini & Frugis in press) and published Atlas works with a local coverage (e.g. Piedmont, Sicily). Older papers were taken into account only in some particular cases. Regions and localities mentioned in the text are shown in Figure 1.

GENERAL RESULTS

Thirteen wader species regularly breed in Italy, while the Snipe *Gallinago gallinago* is an irregular breeder (3 cases in the last 40 years - Silvano 1986). The distribution and population size for six of the regular species are presently known either from more or less complete enquiries (Avocet *Recurvirostra avosetta*, Black-winged Stilt, Lapwing *Vanellus vanellus*), or because of their limited distribution and habitat specialisation (Oystercatcher *Haematopus ostralegus*, Collared Pratincole *Glareola pratincola*, Black-tailed Godwit *Limosa limosa*). For other species (Kentish Plover *Charadrius alexandrinus*, Dotterel *Eudromias morinellus*, Redshank *Tringa totanus*), we have used a combination of local census data and the results of the national Atlas Project to estimate population sizes. For Stone Curlew *Burhinus oedicnemus*, Little Ringed Plover *Charadrius dubius* and Common Sandpiper *Actitis hypoleucos*, however, the distribution is poorly known over large areas, so that no numerical estimate can yet be made. A summary of population estimates is given in Table 1, which also indicates the years from which the most recent data is available.

The distribution of each breeding species (except those with the very localized distribution) is shown in Figures 2, 3 and 5-13. The five maps indicated by the word "Atlas" (Little Ringed Plover, Lapwing Woodcock *Scolopax rusticola*, Common Sandpiper, Stone

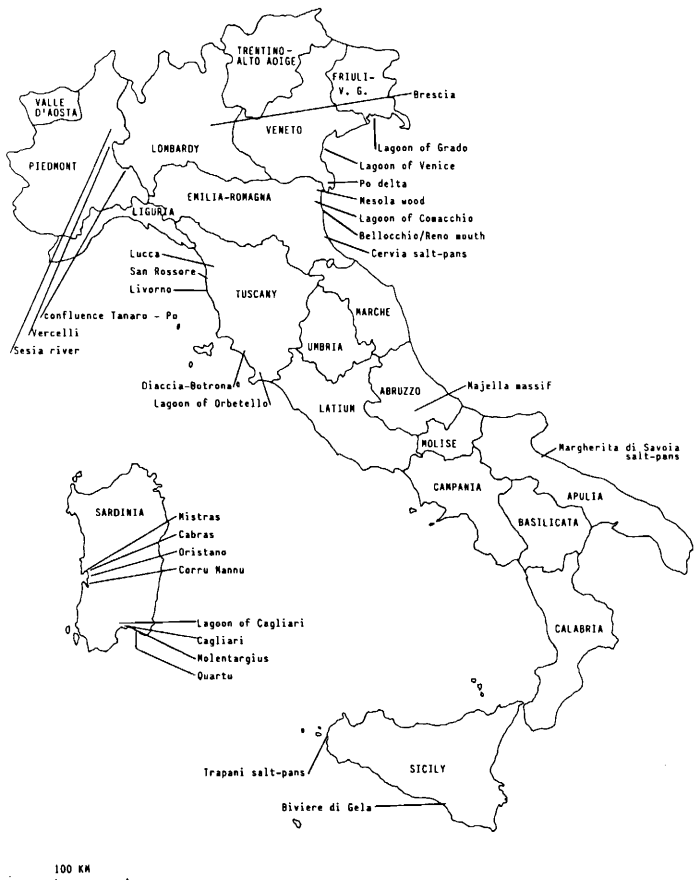


Figure 1. Regions and localities in Italy mentioned in the text.

Curlew), are directly taken from the Atlas Project, with very few additions, due to the lack of any more precise information.

SPECIES ACCOUNTS

Oystercatcher *Haematopus ostralegus* (Figure 2). Regular breeding occurs only in the Po delta (Figure 2), where the population has decreased from c. 40 pairs (1983) to 20-25 (1987),

Table 1. Population sizes of waders breeding in Italy (numbers of pairs and years considered are indicated).

		No. of pairs	Years of Data
Oystercatcher	<i>Haematopus ostralegus</i>	20-25	1987
Black-winged Stilt	<i>Himantopus himantopus</i>	933-1 091	1987
Avocet	<i>Recurvirostra avosetta</i>	1 200-1 300	1987-1988*
Kentish Plover	<i>Charadrius alexandrinus</i>	1 520-2 000	1987-1988*
Little Ringed Plover	<i>Charadrius dubius</i>	?	
Dotterel	<i>Eudromias morinellus</i>	< 10	1978-1984
Lapwing	<i>Vanellus vanellus</i>	600-900	1986-1987
Black-tailed Godwit	<i>Limosa limosa</i>	< 10	1988
Woodcock	<i>Scolopax rusticola</i>	?	
Redshank	<i>Tringa totanus</i>	390-720	1983-1988*
Common Sandpiper	<i>Actitis hypoleucos</i>	?	
Collared Pratincole	<i>Glareola pratincola</i>	30-90	1984-1985*
Stone Curlew	<i>Burhinus oedicnemus</i>	?	

* 1980 for Sardinia



Figure 2. Distribution of Oystercatcher *Haematopus ostralegus* in Italy.

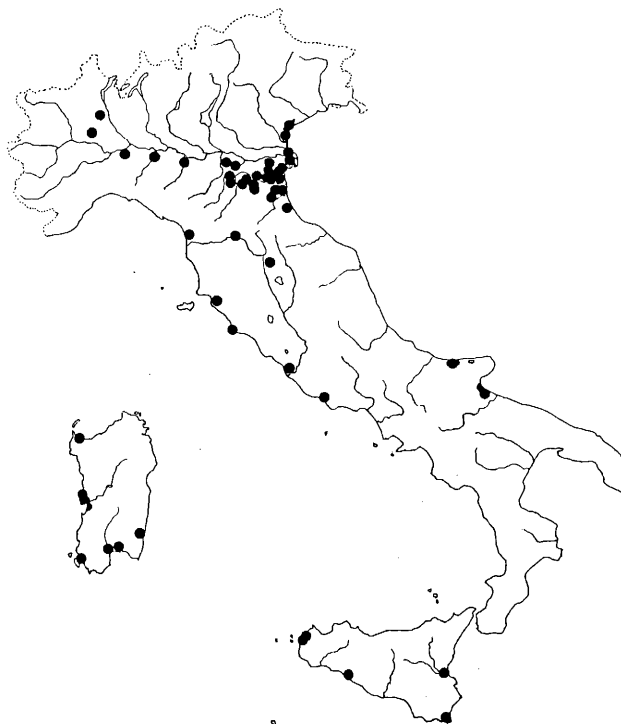


Figure 3. Distribution of Black-winged Stilt *Himantopus himantopus* in Italy.

although only c. 20 pairs had been estimated in 1980 by Pupillo & Boldregghini (1982). Other breeding areas are along the Adriatic coast: Reno mouth (1 pair 1987 and 1988), and Lagoon of Grado (1 pair 1988 - Utmar, in press). On the Tyrrhenian coast, single indications of possible or probable breeding were seen in 1983 and 1984 at Orbetello and San Rossore (Arcamone & Tellini 1985): at the latter site, this species bred regularly in the first decades of this century (Caterini 1932, 1951).

It is unclear whether this situation is the result of a decrease or reflects numerical fluctuations, as described for other marginal breeding areas (e.g. Camargue - Hafner et al. 1985). The major limiting factor for breeding is the impact of tourists on the even remotest beaches.

Black-winged Stilt *Himantopus himantopus* (Figure 3).

A widely distributed species, commonest in northern Italy and Sardinia (Figure 3). Several local studies have been carried out during the last 20 years. A national monitoring project begun in 1984-88 has collected much information on the breeding biology of this species (Tinarelli 1985a, 1985b, unpubl.).

The Black-winged Stilt had scarcely bred in Italy since the beginning of this century. In the early 1960s, however, the population began a steady increase, with birds occupying new areas, so that by 1983 some 1 500 pairs bred. In 1984 and 1985 a sudden decrease over most of Europe also affected the numbers in Italy (Figure 4), and only a slight increase has occurred since then.

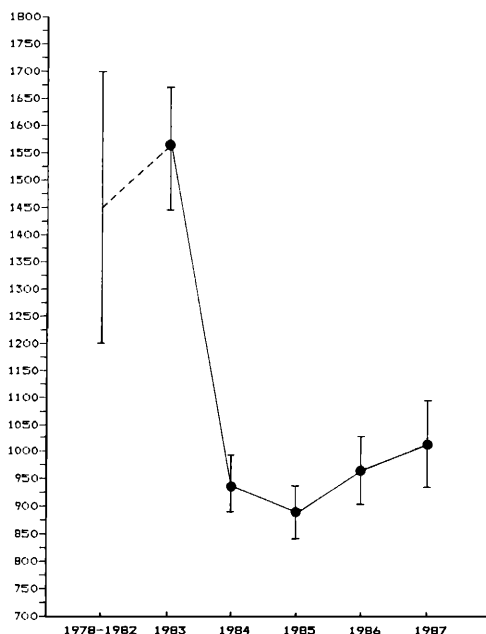


Figure 4. Size of the Italian population of Black-winged Stilt during the years 1978-87.

In 1983-87, 33-45% of the breeding pairs were found in lagoons and coastal ponds, 24-37% in salt-pans, 14-22% in the settling ponds of sugar-factories, 6-9% in freshwater marshlands, 2-4% in rice-fields and 1-3% along artificial lakes and canals.

Avocet *Recurvirostra avosetta* (Figure 5).

After a decline during the last century, the breeding population of Avocet started to increase probably around 1945. A major increase occurred particularly since the late 1970s, although with marked fluctuations, despite the reduction of suitable areas.

In 1987 and 1988, 390-450 pairs were estimated for Emilia-Romagna. Formerly, 500 pairs had been estimated by Pupillo & Boldregghini (1982), though only 308-347 were censused in 1983 (Tinarelli 1983). In the Venetian part of the Po delta and in the Lagoon of Venice, 64-69 pairs were counted in 1988 (Manzi, Tiloca, Stival pers. comm.). In Apulia (Margherita di Savoia salt-pans), breeding started as late as 1979 and reached 30 pairs in 1982 (Allavena 1982), 50 in 1984-85 (Bricchetti in press), and 330-350 in 1988 (Boldregghini, Montanari, Tinarelli: data collected during a survey for the Italian Ministry for Agriculture).

The first breeding report for Sicily was in 1986 (Trapani salt-pans: Surdo 1987) and 10 pairs were found there in 1987 (Surdo, Sara pers. comm.). Sardinia, on the other hand, had already as many as 400 pairs in Cagliari, Molentargius and Quartu wetlands in 1980 (Schenk 1982) and had probably been colonized (or recolonized?) before 1950.

The reproductive biology of Avocets has been investigated by Casini (1986) in Cervia salt-pans, and by Boldregghini, Montanari, Tinarelli (unpubl.) in the Comacchio area and in Cervia and Margherita di Savoia salt-pans. Of the 1 200-1 300 pairs presently breeding in the country, 36% occur on salt-pans. The species currently breeds in 5 regions (Figure 5).



Figure 5. Distribution of Avocet *Recurvirostra avosetta* in Italy.





Figure 6. Distribution of Kentish Plover *Charadrius alexandrinus* in Italy.

Kentish Plover *Charadrius alexandrinus* (Figure 6).

Kentish Plovers are distributed mainly near the coasts on muddy and sandy sea-beaches, salt-pans and less frequently along rocky coasts with scattered sandy areas (Sicily: Massa 1985), little vegetated banks along lagoons and ponds, or bare ground near wetlands (Mainardi 1985). It is very rare inland: 2-3 pairs in 1984 and 1985 along Sesia River in Piedmont (Mingozzi et al. 1989) and 3-5 pairs in 1983-88 on the settling ponds of sugar-factories of Emilia (Tinarelli 1988).

On the Adriatic side, 60 pairs were estimated for Friuli-Venezia Giulia (Utmar pers. comm.), 200-300 for Veneto (Lagoon of Venice and northern Po delta: Manzi pers. comm.), 170-230 in Emilia-Romagna (1985; 25-30 pairs with 50 nests in Cervia salt-pan alone). A total of 60-80 pairs were counted in 1988 in Margherita di Savoia salt-pans, Apulia (Boldreghini, Montanari, Tinarelli unpubl.). On the Tyrrhenian coast 32 pairs were censused in 1988 along 185 km of Tuscan coastline (between the Ligurian border and Punta Ala) by Mainardi (pers. comm.), and additional 10 were estimated for the Lagoon of Orbetello (Calchetti et al. 1987).

Sicily and Sardinia hold respectively at least 400-450 and 200-285 pairs (Massa 1985, Schenk 1982). These figures together form about two-thirds (or less) of the Italian population.

Little Ringed Plover *Charadrius dubius* (Figure 7).

This is the commonest wader breeding in the country, almost continuously distributed in northern Italy. It is usually found along the middle course of stony or gravelly rivers and streams, up to 760 a.s.l. (Mingozzi et al. 1989). It is also regularly observed on sand-

or gravel-pits, settling ponds of sugar-factories, and bare ground often near industrial areas. There is irregular breeding in coastal, brackish wetlands and dune habitat (Sicily - Massa 1985, Apulia - Brichetti in press, Tuscany - Mainardi 1984, Sardinia - Schenk 1982).

Estimates or counts along the main rivers are unfortunately still lacking. It is impossible, for this reason, to attempt any evaluation of the national population, which certainly exceeds several thousand pairs. For very limited areas, however, quite precise data are available: 60-70 pairs in Sicily (Massa 1985); c. 40 in the Livorno province, Tuscany (Mainardi 1984); c. 50-100 in the Brescia province, Lombardy (Brichetti & Cambi 1985); some hundreds in Piedmont, with densities of 2-4 pairs/km along suitable river sectors (Mingozzi et al. 1989) and a group of 9 nests found in a colony of Common and Little Terns on an islet 60x80 m at the Tanaro-Po confluence (Bogliani & Barbieri 1982); and 50-90 pairs in the settling ponds of 13 sugar-factories of Emilia-Romagna (Tinarelli 1988).

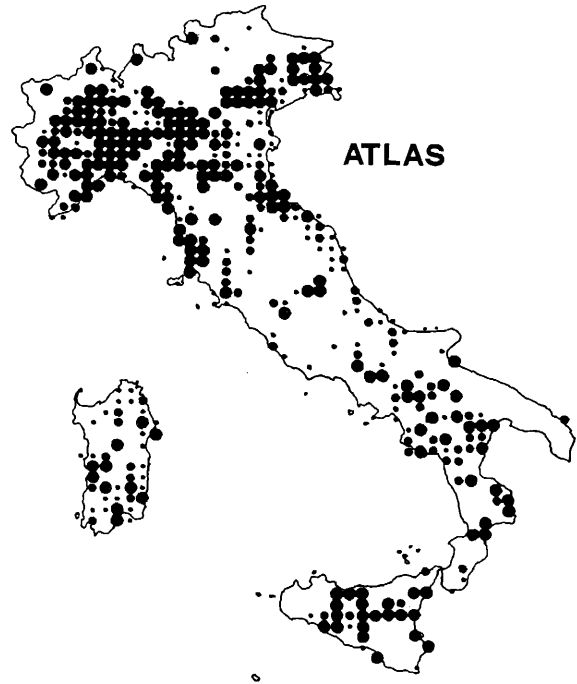


Figure 7. Distribution of Little Ringed Plover *Charadrius dubius* in Italy. Small, medium-sized and large symbols show possible, probable and confirmed breeding respectively.

Dotterel *Eudromias morinellus*.

There are very few breeding areas, on semi-desertic highlands above 2 000 m a.s.l., which are interpreted either as ice-age relicts or, more recently, as quite recent colonizations (Mueller 1987). Alpine settlements within the Italian borders were actually found only in the last few years (Brichetti 1982).

An Apennine population has apparently existed for longer (Maiella Massif - Vaughan 1952, Di Carlo & Heinze 1979a, 1979b, Heinze 1981, 1982, 1983), but no proof of breeding has been collected after 1984 (Petretti pers. comm.).



Figure 8. Distribution of Lapwing *Vanellus vanellus* in Italy.

Lapwing *Vanellus vanellus* (Figure 8).

A widely distributed species in mainly northern Italy, from sea level to about 1 200 m in Alto Adige (Boano & Bricchetti 1986). Maize fields are the commonest breeding habitat, followed by meadows and grassy wetland edges. Only few pairs were breeding before 1950, but the population has much increased (especially in the Po Plain) during the 1970s, probably due to the lower hunting pressure.

Hunting seems, however, to be still the main limiting factor in regions where it remains till early March (Boano & Bricchetti 1986). For the years 1980-85, 700-1 000 pairs were estimated for the whole country, with 53% in Piedmont (Boano & Bricchetti 1986); 600-900 pairs were estimated for the years 1986-87 (Boano pers. comm.). Some aspects of the breeding biology were studied by Boano & Vaschetti (1984), Boano & Bricchetti (1986) and Stival (1988).

Redshank *Tringa totanus* (Figure 9).

A rather localized species with an estimated population of 390-720 pairs. A complete count has, however, never been made. The definition of the breeding distribution is complicated by the presence of many non-breeding birds occurring on most wetlands. For the Lagoon of Venice, the most important site, 300-600 pairs with at least 1 000 non-breeding birds were estimated (Rallo pers. comm.). In the years 1983-86, 40-50 pairs were breeding in the Lagoon of Comacchio and further 40-50 in the Po delta. Outside northern Italy, 3-5 pairs were breeding in Lagoon of Cagliari, Sardinia in 1980 (Schenk 1982) and 2-5 in Margherita di Savoia salt pans, Apulia (Boldreghini, Monanari, Tinarelli unpubl.). Another estimate for the latter site was 10-20 pairs in 1984-85 (Bricchetti in press).



Figure 9. Distribution of Redshank *Tringa totanus* in Italy.

The Redshank seems to breed only in saltmarshes dominated by *Salicornia*, *Spartina* and *Statice*. The destruction of such habitats is the main threat in areas like Comacchio and the Po delta.

Black-tailed Godwit *Limosa limosa*.

A very localized species. The few Italian breeding sites are probably on the southern edge of the species range. Less than 10 pairs are present.

Breeding started in 1977 on rice-fields near Vercelli, Piedmont, and this is still the only site where this bird is regularly present, with 6-9 pairs (Mingozzi et al. 1989). In 1980-83, 1-2 pairs also bred in *Salicornia* marshlands along Comacchio Lagoon, Emilia-Romagna: this site is no longer occupied. There is also an unconfirmed breeding report in Tuscany (Diaccia-Botrona swamp) in 1980 (Rome et al. 1981).

Woodcock *Scolopax rusticola* (Figure 10).

A scarce species, commoner in northern regions. It occurs in both deciduous and coniferous woods, where moist soil is available, from the sea level up to 1 900 m (Valle d'Aosta - Bocca & Maffei 1984), with a marked preference for low-mountain areas. A few pairs breed in coastal woodlands: Migliarino and San Rossore forest, Tuscany (up to 20 pairs in former years - Caterina 1951), Mesola wood and Bellocchio pine-forest, Emilia-Romagna (up to 5 pairs - Pupillo & Boldreghini 1982).

Some 150 breeding sites in the country are presently known, according to a review by Spano (1982) who also suggested that the population breeding in the Alps has increased since 1970, while those of the Po Plain and Apennines are decreasing. Frugis (in Cramp & Simmons 1983)

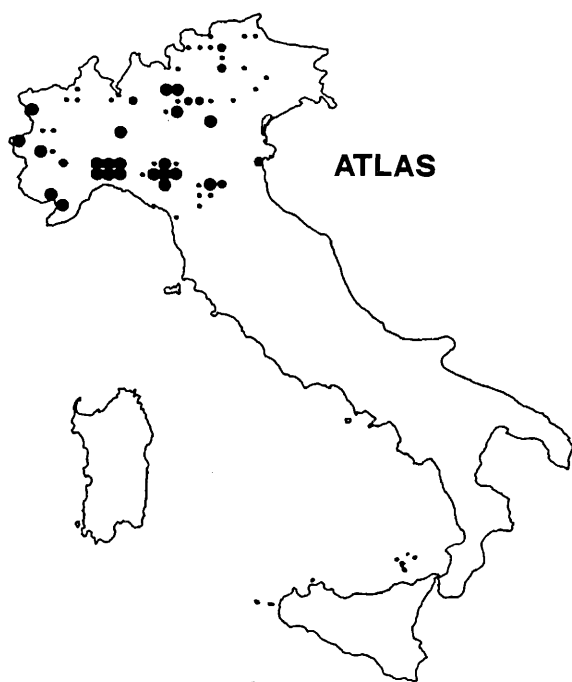


Figure 10. Distribution of Woodcock *Scolopax rusticola* in Italy. Small, medium-sized and large symbols show possible, probable and confirmed breeding respectively.

estimated 150 pairs breeding in Italy, with a declining population size. Although many regular breeding sites are known repeatedly observed, difficulties in finding Woodcocks where they breed at low densities has probably heavily affected the Atlas Project distribution map (Figure 10). It is therefore impossible to provide a new national estimate of the breeding population.

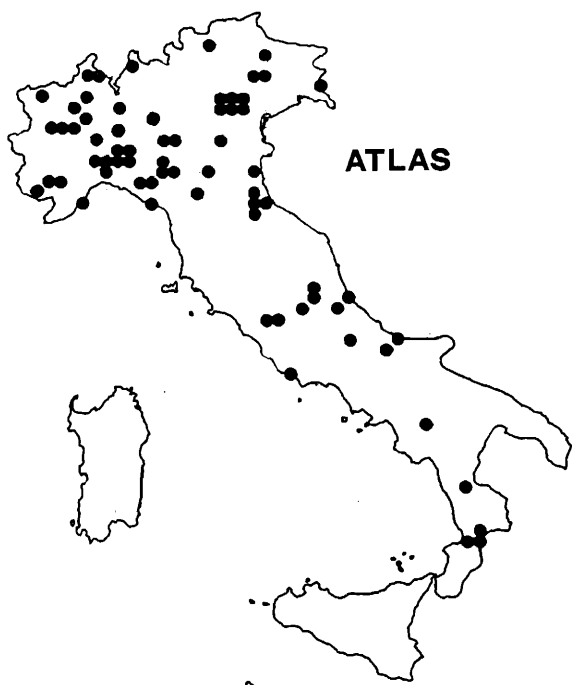


Figure 11. Distribution of confirmed breeding reports of Common Sandpiper *Actitis hypoleucos* in Italy.

Common Sandpiper *Actitis hypoleucos* (Figure 11).

A widespread species, commoner in the north. There are no confirmed breeding reports in Sicily and Sardinia. It occurs along rivers and streams with gravel, sand or mud and often some vegetation; breeding has been reported at altitudes higher than 1 000 m a.s.l. (Brichetti 1985, Mingozzi et al. 1989). Very few pairs have been found in larger wetlands (marshlands, lagoons etc.).

Locating breeding pairs is often quite difficult due to the high number of non-breeding individuals showing territorial behaviour, irregular singing habits in areas with low density of pairs, and a poor knowledge of their breeding biology in Italy.

As for the Little Ringed Plover, any reliable attempt to evaluate the total size of the population is presently impossible, though more than 1 000 pairs are probably present.

Counts or estimates are missing even on a local basis, and the distribution itself is imperfectly known. The Atlas Project map (Figure 11) is highly provisional, since all the possible and probable reports had to be excluded to avoid wrong indications caused by non-breeding birds. This has, however, led to the distribution appearing more scattered than is probably the case.

Collared Pratincole *Glareola pratincola* (Figure 12).

Very few breeding sites are regularly occupied. Pairs sometimes breed in various areas, when there are particularly favourable local conditions. This species occurs on recently reclaimed fields and dried-out parts of ponds or lagoons.



Figure 12. Distribution of Collared Pratincole *Glareola pratincola* in Italy. Some uncertain reports from Apulia are not shown.

In Emilia-Romagna some sites around Comacchio Lagoon hold very variable numbers of pairs (2-30), probably since 1950 (Boldreghini & Montanari 1978, Pupillo & Boldreghini 1982, Canova & Saino 1983, Tinarelli unpubl.). In Tuscany at least one pair bred near Lucca in 1982 and probably also in other recent years (Arcamone *et al.* 1982, Baccetti unpubl.). In Apulia, two pairs bred in 1984 at Margherita di Savoia salt-pans and probably elsewhere (Bricchetti in press).

More numerous populations are present on the main islands. In Sardinia, Schenk (1982) found 40 pairs around 1980, mainly in Oristano area: 10 at Cabras, max. 30 at Mistras and an irregular breeding presence at Corru Mannu and in the Cagliari area. Less than 10 pairs are present in Sicily, where the only site regularly occupied is Biviere di Gela.

These data indicate a total population ranging between 30 and 90 pairs in different years. Very little information on the breeding biology of the Collared Pratincole in Italy is available.

Stone Curlew *Burhinus oedicnemus* (Figure 13). A widespread species, breeding from sea level up to 900 m (Massa 1985) in arid areas with steppe-like vegetation, such as coastal sand-dunes, gravel-flats near rivers or streams, particular forms of cultivated or pasture-lands. It seems to be most frequent on plains of the southern regions and main islands.

Reduction of suitable habitats and possibly also other factors has resulted in a population decrease and some contractions in the range in Italy (e.g. Piedmont: Mingozi *et al.* 1989) as well as in the rest of Europe (Cramp & Simmons 1983). The numerical importance of this species

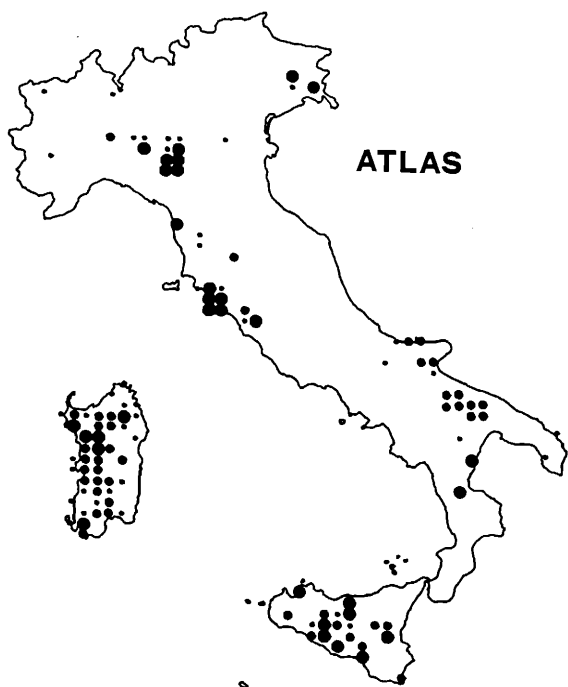


Figure 13. Distribution of Stone Curlew *Burhinus oedicnemus* in Italy. Small, medium-sized and large symbols show possible, probable and confirmed breeding respectively.

in Italy is however under-estimated due to its elusive habits and the poor knowledge of the breeding behaviour. The Atlas Project map (Figure 13) probably reflects these problems and is likely to be incomplete.

Few estimates of the size of local populations have been published so far, except a few indications about very small areas (Calvario *et al.* 1986, Calchetto *et al.* 1987, Dentessani & Genero 1987). More complete data are available for two regions: Tuscany, where 25-50 pairs are probably present (Baccetti, unpubl.) although only 19 pairs were recently found by Meschini & Frascchetti (in press), and Latium, where 12 pairs were censused by the same authors. Much higher numbers are likely to be present in more southern regions.

CONCLUSIONS

The importance of the Italian wetlands for breeding waders is particularly clear in species like the Black-winged Stilt, Avocet and Kentish Plover, which account respectively for 23%, 6% and 18% of the total population occurring in the recently investigated parts of Europe (percentages calculated on the sum of the values indicated by Piersma (1986) and Bartovski *et al.* (1987), plus our data). Italy may be even more important for Little Ringed Plover and Stone Curlew, whose populations we were unable to estimate.

In our view the following subjects require particular attention in the next few years.

1. Determination of the status and national population size, by counts in representative sample areas, of Little Ringed Plover, Common Sandpiper, Woodcock, Stone Curlew;
2. Determination or updating the status and population size, at a regional level, of Kentish Plover (in Latium, part of Apulia, Calabria, Campania, part of Sardinia), Collared Pratincole (Sardinia, Emilia-Romagna) and Redshank (Veneto, Sardinia).
3. Starting or continuing monitoring programmes on Lapwing, Dotterel, Black-winged Stilt, Avocet, Oystercatcher and Black-tailed Godwit.
4. Starting ecological studies to allow conservation programmes on the most endangered species: Dotterel, Oystercatcher and Black-tailed Godwit, and
5. Starting research on the breeding biology of widespread species that are still very little known in Italy: Little Ringed Plover, Common Sandpiper and Stone Curlew.

As a first step, censuses of Little Ringed Plover, Common Sandpiper and Stone Curlew will be carried out, beginning from the 1989 breeding season, on sample areas located in different regions. A total of 12 people have so far agreed to join us in this research - in part a first consequence of our efforts in collating the information for this paper.

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REFERENCES

- Allavena, S. 1982. (Breeding of some Charadriiformes in the natural reserve of Margherita di Savoia salt-pans, Foggia.) *Riv. Ital. Orn.* 52: 198-199.
- Arcamone, E., Baccetti, N., Mainardi, R. & Spina, F. 1982. (Breeding of the Collared Pratincole, *Glareola pratincola*, in Tuscany.) *Riv. Ital. Orn.* 52: 187-190.
- Arcamone, E. & Tellini, G. 1985. (Tuscan bird report: 1983-1984.) *Quaderni Museo St. Nat. Livorno* 6: 79-94.
- Bartovsky, V., Kletecki, E., Radovic, D., Stipcevic & Susic, M. 1987. Breeding waders in Yugoslavia. *Wader Study Group Bull.* 51: 33-37.
- Boano, G. & Bricchetti, P. 1986. (Distribution and breeding of the Lapwing *Vanellus vanellus* in Italy.) *Avocetta* 10: 103-114.
- Boano, G. & Vaschetti, B. 1984. (A record of possible double clutch in the Lapwing *Vanellus vanellus*.) *Avocetta* 8: 43-44.
- Bogliani, G. & Barbieri, F. 1982. (Breeding of the Common Tern, *Sterna hirundo*, and Little Tern, *Sterna albifrons*, along Po river.) *Riv. Ital. Orn.* 52: 91-109.
- Bocca, M. & Maffei, G. 1984. (The birds of Valle d'Aosta.) *Reg. Valle d'Aosta, tip. La Valle, Aosta.*
- Boldregghini, P. & Montanari, F. 1978. (Preliminary report on the status of some birds in coastal wetlands of Emilia-Romagna.) *Atti II Conv. Sicil. Ecol., Noto, October 1977.*
- Bricchetti, P. 1980. (Breeding of the Black-tailed Godwit, *Limosa limosa* (L.) in Valli di Comacchio, Emilia-Romagna.) *Riv. Ital. Orn.* 50: 118-122.
- Bricchetti, P. (ed.), 1982. (Atlas of the birds breeding in the Italian Alps.) *Riv. Ital. Orn.* 52: 3-50.
- Bricchetti, P. 1985. (Guide to the Italian breeding birds.) Scalvi, Brescia.
- Bricchetti, P. & Cambi, D. 1985. (Atlas of the breeding birds in the Brscia province, Lombardy, 1980-84.) *Natura Bresciana* 8 spec. issue.
- Bricchetti, P. in press. (Ornithological report 1984-85, for the "Carta delle vocazioni faunistiche" of Apulia region.) *I.N.B.S.*
- Calchetti, L., Cianchi, F. & Giannella, C. 1987. (The avifauna of Orbetello Lagoon, Grosseto.) *Picus* 13: 81-126.
- Calvario, E., Frascchetti, F., Sarrocco, S. & Sestieri, L. 1986. (New data about the breeding status of the Stone Curlew, *Burhinus oedichnemus*, in Latium.) *Riv. Ital. Orn.* 56: 266-267.
- Canova, L. & Saino, N. 1983. (Confirmed breeding of the Collared Pratincole, *Glareola pratincola*, in the Valli di Comacchio, Emilia-Romagna.) *Riv. Ital. Orn.* 53: 196-197.
- Casini, L. 1986. (Nesting of the Black-winged Stilt (*Himantopus himantopus*) and Avocet (*Recurvirostra avocetta*) in Cervia salt-pans, Ravenna.) *Riv. Ital. Orn.* 56: 181-196.
- Caterini, F. 1932. (Breeding of the Black-winged Stilt (*Himantopus candidus* L.) and Oystercatcher (*Haematopus ostralegus* L.) near Pisa.) *Riv. Ital. Orn.* 2: 47-50.
- Caterini, F. 1951. (San Rossore and its avifauna.) *Boll. Zool.* 18: 327-341.
- Cramp, S. & Simmons, K.E.L. (eds) 1983. *The Birds of the Western Palearctic. Vol. III.* Oxford University Press, Oxford.
- Dentesani, B. & Genero, F. 1987. (Breeding of the Stone Curlew, *Burhinus oedichnemus*, in Friuli.) *Riv. Ital. Orn.* 57: 69-72.
- Di Carlo, E.A. & Heinze, J. 1979. (The Dotterel *Eudromias morinellus* (L.) as a migrant and breeding species in Italy.) *Uccelli d'Italia* 4: 47-67.
- Di Carlo, E.A. & Heinze, J. 1979. (Nesting of the Dotterel in Italy.) *Uccelli d'Italia* 4: 159-174.
- Hafner, H., Johnson, A. & Walmsley, J. 1985. *Compte rendu ornithologique camarguais pour les annees 1982 et 1983. Rev. Ecol. (Terre Vie)* 40: 87-112.
- Heinze, J. 1981. (Ornithological observations on the Maiella massif.) *Uccelli d'Italia* 4: 254.
- Heinze, J. 1982. (Ornithological observations on the Maiella massif, Abruzzo.) *Uccelli d'Italia* 7: 192-194.
- Heinze, J. 1983. (Ornithological news from Abruzzo.) *Uccelli d'Italia* 8: 274-276.
- Mainardi, R. 1984. (Little Ringed Plover *Charadrius dubius* breeding in Livorno province during 1983: density, distribution and breeding habitats.) *Quaderni Mus. Stor. Nat. Livorno* 5: 117-126.
- Mainardi, R. 1985. (Kentish Plover *Charadrius alexandrinus* breeds in the province of Livorno: breeding in natural and artificial sites.) *Quaderni Mus. Stor. Nat. Livorno* 6: 119-122.
- Mascara, R. 1987. (Nesting of Collared Pratincole, *Glareola pratincola*, in a cereal area of Sicily.) *Riv. Ital. Orn.* 57: 137.
- Massa, B. 1977. (A study of the population of the Kentish Plover *Charadrius alexandrinus* in Trapani salt-pans.) *Il Naturalista Siciliano* 4: 1-15.
- Massa, B. 1978. (A study of the Sicilian Charadriiformes.) *Proc. II Convegno Siciliano di Ecologia. Noto, October 1977.*
- Massa, B. (ed) 1985. (Atlas of the birds breeding in Sicily (1979-1983).) *Il Naturalista Siciliano* 9, spec. issue.
- Meschini, A. & Frascchetti, F. in press. (Distribution, size and habitat of the Stone Curlew *Burhinus oedichnemus* in Latium and Tuscany.) *Avocetta*.
- Meschini, E. & Frugis, S. in press. (Atlas of the birds breeding in Italy.) *Suppl. Ric. Biol. Selv.*
- Mingozzi, T., Boano, G. & Pulcher, C. (eds) 1989. (Atlas of the birds breeding in Piedmont and Valle d'Aosta.) *Mus. Reg. Scienze Naturali, Monogr.* 8. 513 pp.
- Mueller, H. 1987. Are the southern breeding areas of the Dotterel *Eudromias morinellus* relicts of Ice Age? *Wader Study Group Bull.* 51: 22.
- Piersma, T. 1986. Breeding Waders in Europe. *Wader Study Group Bull.* 48, Supplement.
- Pupillo, P. & Boldregghini, P. 1981. (Faunistic value of the Po delta.) *Quad. Italia Nostra* 14: 61-71.
- Rome, A., Travison, G., Rosselli Del Turco, B. 1981. (Researches on Tuscan wetlands. IX. Avifauna of Castiglione della Pescaia swamp and adjacent territories, Grosseto.) *Uccelli d'Italia* 6: 7-33.
- Schenk, H. 1982. Wetlands of international importance in Sardinia. *Suppl. Ric. Biol. Selvaggina* 8: 759-783.
- Spano, S. 1982. (Monograph on Woodcock.) Olimpia, Firenze.
- Silvano, F. 1986. (Common Snipe, *Gallinago gallinago*, nesting in Piedmont (NW Italy).) *Riv. Ital. Orn.* 56: 267-268.
- Stival, E. 1988. (Lapwing *Vanellus vanellus* in Venetia.) *Lavori Soc. Ven. Sc. Nat.* 14: 101-109.
- Surdo, S. 1987. (First breeding of the Avocet, *Recurvirostra avocetta*, in Sicily.) *Riv. Ital. Orn.* 57: 150.
- Tinarelli, R. 1983. (The distribution and status of *Recurvirostridae* in western Emilia-Romagna.) *II Convegno Ital. Ornit., Parma 1983.* (unpubl. report).

- Tinarelli, R. 1985a. (First national census of the Black-winged Stilt *Himantopus himantopus*.) *Proc. 3^o Convegno Italiano di Ornitologia, Salice Terme*: 305-306.
- Tinarelli, R. 1985b. (The Black-winged Stilt project: first results and proposals.) *Boll. Mus. St. Nat. Lunig.*, 4: 43-52.
- Tinarelli, R. 1988. (The importance of the settling ponds of sugar factories for breeding and migrating waterfowl.) *Picus* 14: 31-39.
- Utmar, P. in press. (First breeding record of the Oystercatcher in Friuli-Venezia Giulia.) *Riv. Ital. Orn.* 59.
- Vaughan, R. 1952. (Confirmed breeding of the Dotterel (*Charadrius morinellus*) in the Maiella massif, Abruzzi.) *Riv. Ital. Orn.* 22: 162.

STARVATION OF CURLEW *NUMENIUS ARQUATA* CHICKS

D. W. & P. E. Yalden

While surveying one of the Peak District moors for breeding Golden Plovers *Pluvialis apricaria* on 11 June 1988, DWY heard anxiety squeaking from wader chicks which, when eventually traced, were emanating from two Curlew *Numenius arquata* chicks. It took about 15 minutes to trace, ring, weigh and release both chicks, during which time there were no adults in attendance. The following day on another moor about 15 km away, the same thing occurred, though only one of these two chicks was actually traced and ringed. Again, no adults were present.

Ten days later, PEY was surveying the first area using our Labrador Chad to search for corpses of chicks killed by other dogs. She located the decayed, almost mummified, remains of the two Curlew chicks, still huddled together apparently where DWY had left them. This prompted a survey of the other area on 3 July, without success. However, on 10 July, Chad picked up a decayed corpse, which proved from its ring to be the third chick, about 300 m away from where it had been ringed.

We had earlier ringed six other chicks, newly hatched, at two nest sites (one on each area). These weighed, on average 50 g, and had bills 19 mm long (Table 1). We thought, from behaviour of adult Curlews in those territories during earlier censuses, that the three older chicks were 8-10 days old, and certainly their bills were around 5 mm longer. However, their weights were on average lower than those of the six newly-hatched chicks. It seems clear that they had died of starvation.

The main early source of food on these

cotton-grass *Eriophorum* dominated moors is the flush of the crane-fly *Tipula subnodicornis*. However, after a mild spring, these hatched rather early in 1988, and the peak counts (over 10 per minute) lasted only from 12-21 May. A second food source, in the form of abundant lycosid spiders and carabid beetles, usually follows the tipulid season, but in 1988 a cool wet spell in mid-June seems to have delayed or minimised this food supply (we were not operating pitfall traps in 1988, but usually one sees spiders running about, and they were not evident during this period).

Probably we are not the only wader-ringers who have heard these alarm calls on the moors, and used them to trace and ring the chicks. We have presumed in the past that the chicks were cold, and calling for their parents to brood them. Only the notable ability of our Chad allows us to suggest with some confidence that they are in fact starving. This raises several interesting ethical problems. Should one ring such chicks? (We could not have made our case without doing so.) Should one try to feed such chicks, or take them into captivity to feed them up for a few days? If one did, would their parents return to brood and guard them? (It seems unlikely.) The scientific argument, undoubtedly, should be that one does ring them, letting nature take its course, and then hope to find the evidence. Clearly, all those people ringing wader chicks on moorland should avail themselves of a good Labrador!

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Table 1. Weights and bill lengths of Curlew *Numenius arquatus* chicks ringed in the Peak District in 1988. (A) newly hatched chicks, ringed at the nest, (B) older chicks, heard giving distress calls on the moor.

RING NO	DATE	WEIGHT (g)	BILL LENGTH (mm)	GRID REF	DATE FOUND
A newly hatched					
FV55491	21.v.88	47	19	SE068063	----
FV55492	21.v.88	45	18	SE068063	----
FV55493	2.vi.88	55	19	SK086921	----
FV55494	2.vi.88	51	18	SK086921	----
FV55495	2.vi.88	50	19	SK086921	----
FV55496	2.vi.88	54	21	SK086921	----
	x	50.3	19.0		
	SD	3.9	1.1		
B older chicks					
FV55497	11.vi.88	47	23	SK066915	21.vi.88
FV55498	11.vi.88	52	25	SK066915	21.vi.88
FV55499	11.vi.88	43	25	SE053049	10.vii.88
	x	47.3	24.3		
	SD	4.5	1.2		