WINTERING AND MIGRATING WADERS IN THE MEDITERRANEAN

by Cor J. Smit

Previous studies, summarized in Evans *et al.* (1984), have shown that large concentrations of palearctic and nearctic waders winter on intertidal mudflats along the coast of western Europe and West Africa. Because most of the coastline of the Mediterranean consists of either rocky shores or sandy beaches and the tidal amplitude only amounts to about 20-30 cm, the area at first sight does not appear very suitable for waders. A previous review (Prater, 1976) supported this idea. By totalling all information available at that time, Prater arrived at about 120 000 wintering waders for the whole area. In the past 10 years considerably more information on wader numbers has been collected, including counts from sites which were previously unknown (e.g. Algeria, Egypt, France, Spain and Tunisia). Still more quantitative information may be available, which has not yet been published. This paper presents a more up to date summary of data for the whole Mediterranean area, and aims also to stimulate publication of still unavailable data and to promote further research, through counts and ringing. Hopefully it is a step towards a more profound understanding of the role of the Mediterranean for wintering and migrating waders.

A more comprehensive version of this project will be published in the Proceedings of the First Conference on Birds Wintering in the Mediterranean, held in Aulla, Italy in February 1984.

WINTERING NUMBERS

The available data have been summarized in Table 1 and Figure 1. No attempts have been made to estimate numbers of Stone Curlew *Burhinus oedicnemus*, Senegal Thick-knee *Burhinus senegalensis*, Cream-coloured Courser *Cursorius cursor*, Lapwing *Vanellus vanellus*, Spur-winged Plover *V. spinosus*, Golden Plover *Pluvialis apricaria*, Dotterel *Eudromias morinellus* and Woodcock *Scolopax rusticola*, since these species often occur far from wetlands. Snipe *Gallinago gallinago*, Great Snipe *G. media* and Jack Snipe *Lymnocryptes minima* have not been included since it is impossible to make reliable estimates of their numbers, using standard wader counts. The most recent figures suggest that total numbers of waders in the Mediterranean exceed 500 000 waders. This increase is mainly due to the large concentrations found in Egypt (Meininger & Mullie, 1981; Meininger, pers. comm.) and Tunisia. By far the most important area is the Gulf of Gabes in Tunisia. This area has a tidal amplitude of up to 2 meters and has been described in more detail by Czajkowski (in press) and Van Dijk *et al.* (1984). The totals presented here may increase yet further, since local concentrations, not yet reported, are likely to be found in the future. This applies especially to Italy and Sicily where the coasts are still incompletely covered by counts, and to Greece and Turkey, where the large river deltas may hold many more waders than are now known.

NUMBERS OUTSIDE MID-WINTER

Very little quantitative information is available from periods other than mid-winter. However, the existing data suggest that numbers in the central part of the Mediterranean in autumn and spring may greatly exceed those in winter. Counts are available throughout the year from the Ebro delta (Spain) (Motis *et al.*, 1981) where numbers gradually increase throughout autumn, peak in winter and drop again in spring. These figures indicate that waders wintering in West African wetlands do not make a short cut along the east coast of the Iberian peninsula during spring migration. Data from the Camargue (France) show a somewhat different pattern, with relatively high numbers in autumn and spring (Blondel & Isenmann, 1981). Spring numbers in some sites in Tunisia (Smart, pers. comm.), Italy (Scott, 1980, Schenk, pers. comm.) and Greece (Engelmoer & Bloksma, 1982) point towards an intensively used route through the central part of the Mediterranean in spring. Analyses of ringing recoveries and migration patterns (Wilson *et al.* 1980) suggest that Curlew Sandpipers *Calidris ferruginea*, migrating from West and Central African winter quarters, cross the Sahara to Tunisia, Italy, and the Black Sea. This idea is supported by radar studies (Grimes, 1974), showing extensive north-eastward movements of waders from Ghana across the Sahara in spring. There are indications that such a route may also be used by Grey Plovers *Pluvialis squatarola* and Little Stints *Calidris minuta*, both being relatively

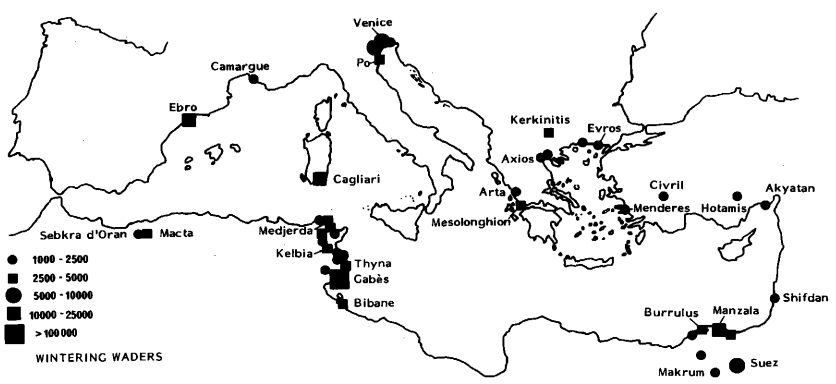

Figure 1. Sites of major importance for wintering waders in the Mediterranean.

Table 1. Average number of waders wintering in wetlands along the Mediterranean.

	Algeria	Cyprus	Egypt	France	Greece	Israel	Italy	Morocco	Spain	Tunisia	Turkey	Previous estimate (Prater 1976)	New estimate
Rostratula benghalensis			500										500
Haematopus ostralegus			500-800	5	120		10		5	2900	5	800	3600
Himantopus himantopus	500		50			610	10-60		30	1100		100	2300
Recurvirostra avosetta	1800	10	4000-10 000	500	3800	370	2000		850	9150	740	15 000	26 000
Pluvialis squatarola	40	10	500-1000	250	350		1750		550	20 500	70	3000	24 000
Charadrius hiaticula		10	2000-3000	5		80	150-300		60	400		100	3300
C. dubius	5	20	50			10		10					100
C. pecuarius			100-500										300
C. alexandrinus	1000	300	15 000-20 000	90	250	20	2300	20	250	13 500	320	3000	36 000
C. leschenaultii			1000			10							1100
Limosa limosa	420		50		2150	160	25		2050	2200	1310	10 000	8400
L. lapponica							5		40	2100		100	2100
Numenius phaeopus			5						60				65
N. tenuirostris	10												10
N. arquata	100	10	200-400	80	1300		4000		140	11 750	930	7800	19 000
Tringa erythropus	120	10	400-800		70	60	1100		20	1300	260	800	3500
T. totanus	180	300	8000-10 000	150	2600	610	3000	10	480	17 100	2050	9000	35 000
T. stagnatilis			50-100			30	10			10			100
T. nebularia	10		300-500		20	40	500		110	700	20	200	1800
T. ochropus	120		200-400			40	50-500		5		20		800
T. glareola	20		100-200			5	5-20						200
Actitis hypoleucos	10	10	500-1000		10	90	700		20	20			1600
Arenaria interpres	10		100-500			5		5	10	450		250	800
Calidris canutus							6-10			100		100	100
C. alba	50		2000-3000				100-200	40	60	300	5	200	3100
C. minuta	2300	100	25 000-40 000	200	250	240	12500		550	22 900	870		72 000
C. temminckii			50-100				0-5			5			100
C. alpina	1850	100	15 000-30 000	1400	7200	60	15500		5200	178 000	5050	70 000	237 000
C. ferruginea			10			350				5050			5400
Philomachus pugnax	150	10	1000-2000	5	80	30	50		30	1400	990	400	4200
Unidentified waders	250				2800	1830				4300			9200

common in Tunisia in spring (Morgan, 1982). Similar patterns have recently been confirmed by Beintema *et al.* (1985) for Black-tailed Godwits *Limosa limosa* and Ruffs *Philomachus pugnax*, which are numerous in Italy, especially in spring. It is likely that these birds come not only from the inner delta of the Niger (Mali) and the area around Lake Chad, but also from West African wetlands. Counts and ringing studies in the Mediterranean wetlands, especially in spring, are needed to update information on numbers, origin and migration routes of the birds involved. Mediterranean wetlands appear to be of much greater importance to waders than previously thought, both in winter and during migration. Italian ringers have recently initiated studies to fill this gap in our knowledge; ringing activities in Rades, Tunisia, are also being revitalized.

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DIURNAL AND SEASONAL VARIABILITY IN THE BREEDING BEHAVIOUR AND DETECTABILITY OF SNIPE

by T.M. Reed

For almost all bird species there is, in the breeding season, a bimodal peak in vocal activity during the day, with most activity in the hour or so around dawn, a lesser peak near dusk (Emlen 1971; Reddig 1978; Skirvin 1980; Reed *et al.* 1983, 1985). The existence of such strong variability in bird behaviour might be expected to affect the results of censuses of Snipe carried out at different times of day. Reed *et al.* (1983, 1985) have shown diurnal variability in detectability for several species of wader. Here I compare the results of Snipe *Gallinago gallinago* censuses carried out on an area of damp pasture in Cambridgeshire in the first few hours after dawn, and then on the same area later in the day.

STUDY AREA AND METHODS

A 94 ha. tract of washland (winter flooded meadows) on the Ouse washes, Cambridgeshire was censused on five days between the start of May and the end of June 1984. The area surveyed was divided into individual washes, each approximately 100 m wide, bounded laterally by straight drainage channels and at the ends by canalised rivers 800 m apart. The washes were used for periodic grazing or cut for hay after the completion of the study. The particular block chosen was known to hold high populations of Snipe (Green pers. comm.), and was nest-searched independently of the current survey (Green 1985), allowing comparisons of behavioural changes against the stage of the breeding cycle.

The study area was visited twice a day every 14 days from 1 May until 25 June by two observers. Between 05.00 and 08.30 on each day, just after dawn, observers walked approximately 100 m apart, following the straight drainage channels, recording all Snipe seen or heard on 1:5 000 scale maps. Observers met at the head of each wash and compared records to reduce double recording. After completing the survey, observers left the washland for 3-4 hours before resurveying the area between 11.15 and 14.10, starting at the opposite end, and walking in the opposite direction, to the previous visit.

At the end of each day, observations were transferred onto summary maps. For each visit observations were subdivided into 5 types:

1. Non-sound observations: observations where birds did not make a sound.
2. Alarm calls: the single note alarm call given when flushed, usually whilst feeding on a channel edge.