

Migrating Ruffs *Philomachus pugnax* through Europe, spring 1998

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As part of a WSG-project in spring 1998 a simultaneous census of Ruffs on migration was carried out in Europe. Ruffs were censused in 13 European countries at 171 different locations. A maximum of 55,000 Ruffs were counted, with highest numbers in the Netherlands, Italy and the Ukraine. In this paper the timing of migration is discussed as well as the development of the sex-ratio. The relatively high proportion of males at the western range of the migration route was particularly apparent. In Central and Eastern Europe a declining proportion of males was reported in the course of the migration period. It is planned to repeat the project in spring 2001 and spring 2002.

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INTRODUCTION

In many European countries Ruffs are common visitors in spring. There are known to be important staging sites in Hungary, Italy, Ukraine, Turkey and in low lying areas in the north-western part of continental Europe. In 1997 a two-year WSG project was launched to get a better picture of spring migration of Ruffs throughout Europe. Its main objectives were to unravel the timing of spring migration and to locate the main staging sites in each European country. By means of a series of simultaneous counts at different sites in Europe, information was gathered on migrating numbers and changing sex-ratios in the course of the migration period. Preliminary results of the census in spring 1997 were published by Wymenga (1997). This paper deals with the spring-census in 1998. At the time of writing not all data are available. A complete analysis of both spring censuses will be published at a later stage.

METHODS

In the months preceding the period of spring migration, wader-observers and local study groups were contacted in nearly all countries in Europe. The network of WSG members proved to be very effective: it was used as a first step to locate potential participants. Moreover, help was obtained from several WSG members who acted as national or regional co-ordinators or supplied useful addresses. In addition to the networking a call-for-help was placed in the *WSG Bulletin*. In total, observers were approached in 27 European countries. All participants received instructions and census forms, either by post or by e-mail.

The spring census in 1998 covered eight census periods between 12 February and 1 June (Table 1), each with a preferential date to perform a simultaneous count of Ruffs. Roost counts were recommended. Although preferential dates were given for the simultaneous counts, in practise all counts executed four days before or after these dates were included in the results. When more than one count was available for a

census period, the maximum was used. When numbers were given as a range (min-max), the mean was taken.

In addition to the counts, observers were asked to gather information on the sex-ratio of groups of Ruffs in the same periods in which counts were carried out. People were asked to send in date, location, group-size, numbers of males each time they made an observation of this kind. In this way, the basic data could be used for statistical analysis. In addition to these data, information was gathered on the main foraging and roosting habitats of Ruffs at the different sites.

RESULTS

Participation

Counts were carried out in at least 13 European countries (not all data have been received yet) by a total of more than 200 active counters. The census sites were well spread over Europe (Figure 1), with especially good coverage in Italy and Fryslân, one of the northern provinces of the Netherlands. However, with such a large area to cover, it was clear beforehand that important sites would be missed, especially in sparsely populated regions. Major staging sites of Ruffs which were not included in the census are wetlands in Turkey, the Danube delta, wetlands in Hungary, several wetlands in the Baltic area and, notably, north-west Russia.

Numbers

Table 2 summarises the results of the spring census, giving summed totals of Ruffs counted at clusters of sites. The maximum total number of Ruffs counted in any one period was 55,000 (in 1997 the maximum was 45,000). By far the largest numbers were found in Fryslân, the Netherlands, where numbers reached 45,000 Ruffs in the first week of April, but taking into account a few uncounted large roosts, probably more than 50,000 birds were present at any one time. Relatively large numbers were also counted in Italy, the Ukraine (Sivash, Crimea), Belarus (Polesia) and Estland (Matsalu reserve).



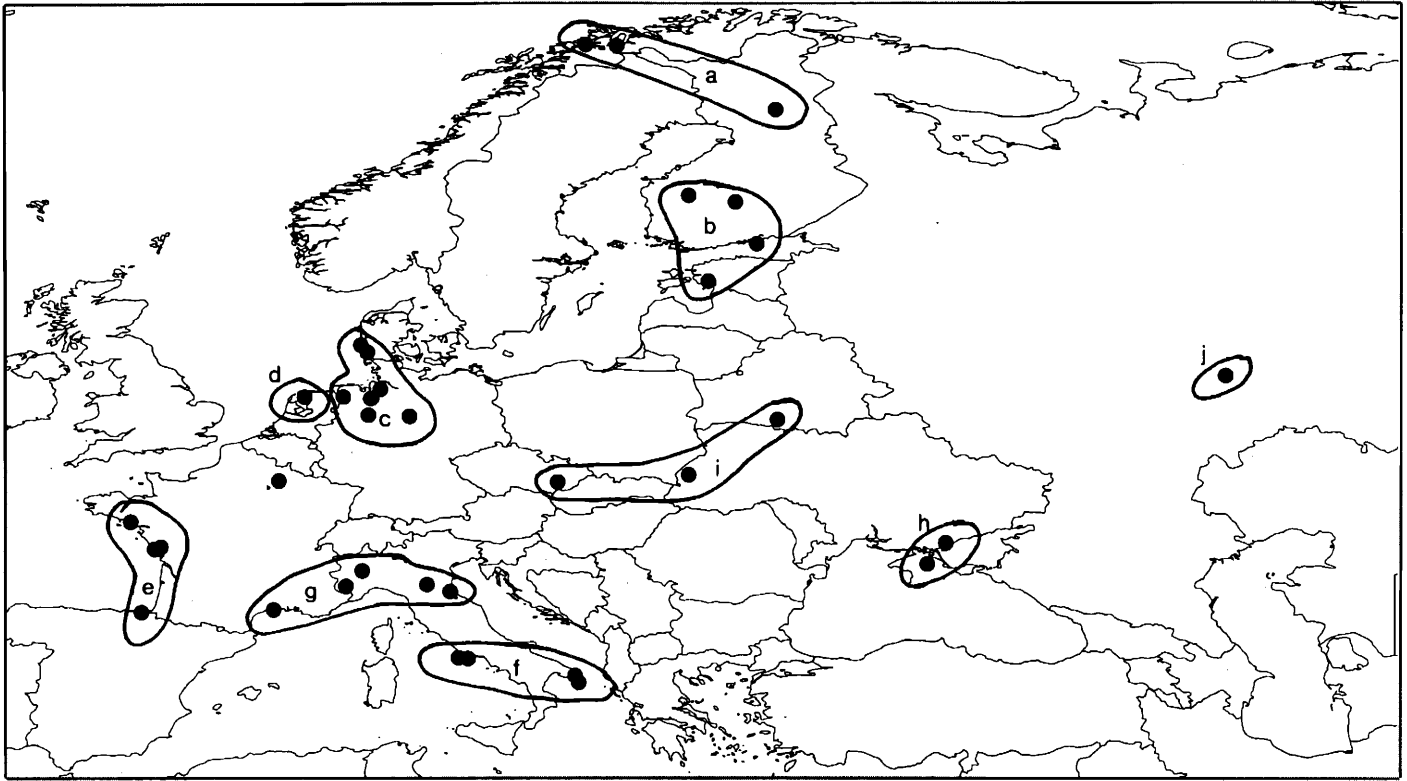


Figure 1. Locations in Europe where Ruff counts were carried out in spring 1998. In a number of cases one dot represents more than one location. The circles indicate clusters of sites and correspond with Table 2 and Figure 2.

In western Europe, most of the known staging sites for Ruffs in spring (see van Dinteren 1987, van Rhijn 1991) were covered in 1998. The figures in Table 2, suggest that the sites in Italy and the Netherlands can be regarded as the most important spring staging sites in western Europe. Within the Netherlands, Ruffs are almost confined to the south-western part of the province of Fryslân. Here they use intensively managed meadows (clay and peat soils) as feeding grounds and floodplain meadows and shallow lake fringes as roosts sites (Jukema *et al.* 1995, Wymenga 1995). In Italy, important Ruff sites are found in the Po Valley and scattered throughout the coastal wetlands. The birds use a variety of habitats here, from rice fields, artificial ponds, sewage farmlands to salt marshes, wet grasslands and shallow lake fringes.

The figures in Table 2 do not reflect the actual numbers of Ruffs migrating through central and eastern Europe. In the first place a lot of important Ruff sites are not included in the census (see above). Secondly, available census data from some extensive wetland areas were incomplete. For instance, Chernichko *et al.* (1992) mention 150,000-250,000 Ruffs in

spring for the whole Sivash in the Crimea, whereas during this count about 7,500 were counted at two sites in this huge area. Furthermore, several WIWO expeditions in the 1980s and 1990s revealed large concentrations of Ruff in central Anatolia and coastal wetlands in Turkey. Harengerd *et al.* (1991) counted more than 5,000 birds in part of the Danube delta. Large spring concentrations of Ruffs have also been recorded in Hungarian wetlands (for example 20,000 in 1995, Góder & Rimóczy 1996). The situation in the Baltic countries, Belarus and north(west) Russia is not well-known, but one can imagine that large spring concentrations of Ruffs may be present there.

Timing of Migration

Although the present material throws no light on the actual number of Ruffs which migrate through different parts of Europe, it does provide a good picture of the timing of migration. In Figure 2 the relative abundance of Ruffs and the percentage of males at different locations is presented. The histograms are arranged in such a way, that the (clusters of) areas which are situated in the western part of Europe are found on the left side of the figure and the eastern areas on the

Table 1. Simultaneous census periods in spring 1998 with preferential dates.

Period	Simultaneous census periods	Preferential date
1	12-15 February 1998	13 February 1998
2	26 February - 1 March 1998	28 February 1998
3	12 - 15 March 1998	13 March 1998
4	2-5 April 1998	3 April 1998
5	16-19 April 1998	17 April 1998
6	30 April - 3 May 1998	3 May 1998
7	14 - 17 May 1998	15 May 1998
8	28-31 May 1998	29 May 1998



Table 2. Numbers of Ruffs counted at different locations in Europe. Numbers are expressed as summed totals in clusters of locations. Periods are indicated by preferential date (see Table 1). Code = letter-code which refers to Figure 1 and 2, + present in low numbers. The number of counted sites in each cluster is given in brackets.

Code	Region & Country	13 Feb	28 Feb	13 Mar	3 Apr	17 Apr	1 May	15 May	29 May
a	Northern Norway (4), Lapland (1)	0	0	0	0	0	0	224	379
b	Matsalu,, Estonia (1) & South Finland (3)	0	0	0	0	32	3057	1908	0
c	Lower Saxony (35), Germany & West Denmark (2)	0	3	14	155	910	369	142	13
d	Fryslan, The Netherlands (101)	+	5312	13213	45133	28609	16504	1456	335
e	Asturies, Spain (1), West & Northern France (5)	1	59	824	402	365	44	4	6
f	Southern Italy (6)	13	50	2525	981	34	200	0	0
g	Northern Italy (5), Southern France (1)	17	527	2888	5620	3891	1184	51	0
h	Sivash, Crimea, Ukraine (2)	0	0	0	2650	1200	7475	815	83
i	Ukraine, Czechoslovakia, Belarus (3)	0	0	0	121	1750	1753	857	125
j	Simbirsk, Poccua, Volga barrage, Russia (1)	0	0	0	0	0	0	25	50
	171 counted sites	> 31	5951	19458	54962	35841	28336	5282	741

right, whereas the southern areas are placed at the bottom and the northern ones on top. Though a little suggestive, it is not supposed to indicate separate migration routes. There is evidence from several studies that Italian ringed/marked Ruffs, for instance, can migrate to the Netherlands and areas in the Baltic (i.e. Poland), but also may take a more easterly direction (Bacetti *et al.* 1997, OAG Münster 1989). Figure 2, therefore, is primarily meant to compare migration patterns at different points in the migration route.

Western Europe: In 1998, the first Ruffs arrived in Europe at the end of February, with more than 5.000 Ruffs already present in Fryslân, The Netherlands. Migration got well under way in the first week of March (period 3), with a clear peak in the areas in southern Europe and fair numbers in Fryslân (Table 2). The first migrants consisted mainly of males (Figure 2), which is in accordance with the finding that males winter further north than females and precede females during spring migration (van Rhijn 1991, OAG Münster 1996).

The timing of migration in northern Italy (locations in the Po valley) and southern France (Etang d'Or, Montpellier) in 1998 clearly differed from southern Italy. In the former two areas numbers gradually increased during March, peaked in the beginning of April, and decreased slowly afterwards. This timing closely resembles Fryslân (compare Figures 2d and 2i), although the latter is situated more than 1,800 km to the north. In view of the abundance of the species in Fryslân and the absence of large concentrations in south-west Europe, it is likely that a significant proportion of the Dutch birds arrived directly from their African winter quarters. This suggests that, in spring, fewer Ruffs migrate from Italy to The Netherlands (as proved by ringed and marked birds) than suggested by van Rhijn (1991). Several sightings in Fryslân in 1985 of Ruffs

colour-dyed in Senegal (OAG Münster 1989), support the idea that a large part of the winter population of Ruffs in Senegal uses Fryslân as a main stop-over site during spring migration. However, the first birds which arrive in Fryslân -nearly 100% males- probably originate from more northerly (west European) winter quarters, as their arrival weights are normally relatively high and do not suggest long, exhausting flights (Jukema pers comm., see Jukema *et al.* 1995).

In Lower Saxony (Germany) and west Denmark, the picture is comparable to the one in Fryslân, though the peak migration is two weeks later (Figure 2c). Also the male percentage increased slightly here, after a drop in the period in which the majority of Ruffs arrived (5). Further to the north, the peak of migration is shifted to May (periods 6-8). In northern Norway and Finnish Lapland, an increasing proportion of males was found towards the end of May (Figure 2a). Since, the birds counted in northern Norway in period 8 were all breeders (K. Birger-Strann pers. comm.), this figure may be influenced by the fact that breeding reeves are very inconspicuous and are underestimated in this type of count.

Eastern Europe: Ruffs which pass through central and eastern Europe may partly originate from other winter quarters than the migrants from western Europe. In addition to the Senegal Delta, the wintering grounds may be situated in the Inner Niger Delta in Mali, floodplains in Nigeria and around Lake Chad (van Rhijn 1991). This may lead to differences in the timing of migration.

In 1998, the first Ruffs in the Sivash and the sites in central Europe arrived at the beginning of April. Peak numbers occurred in the second half of April and in the Sivash at the



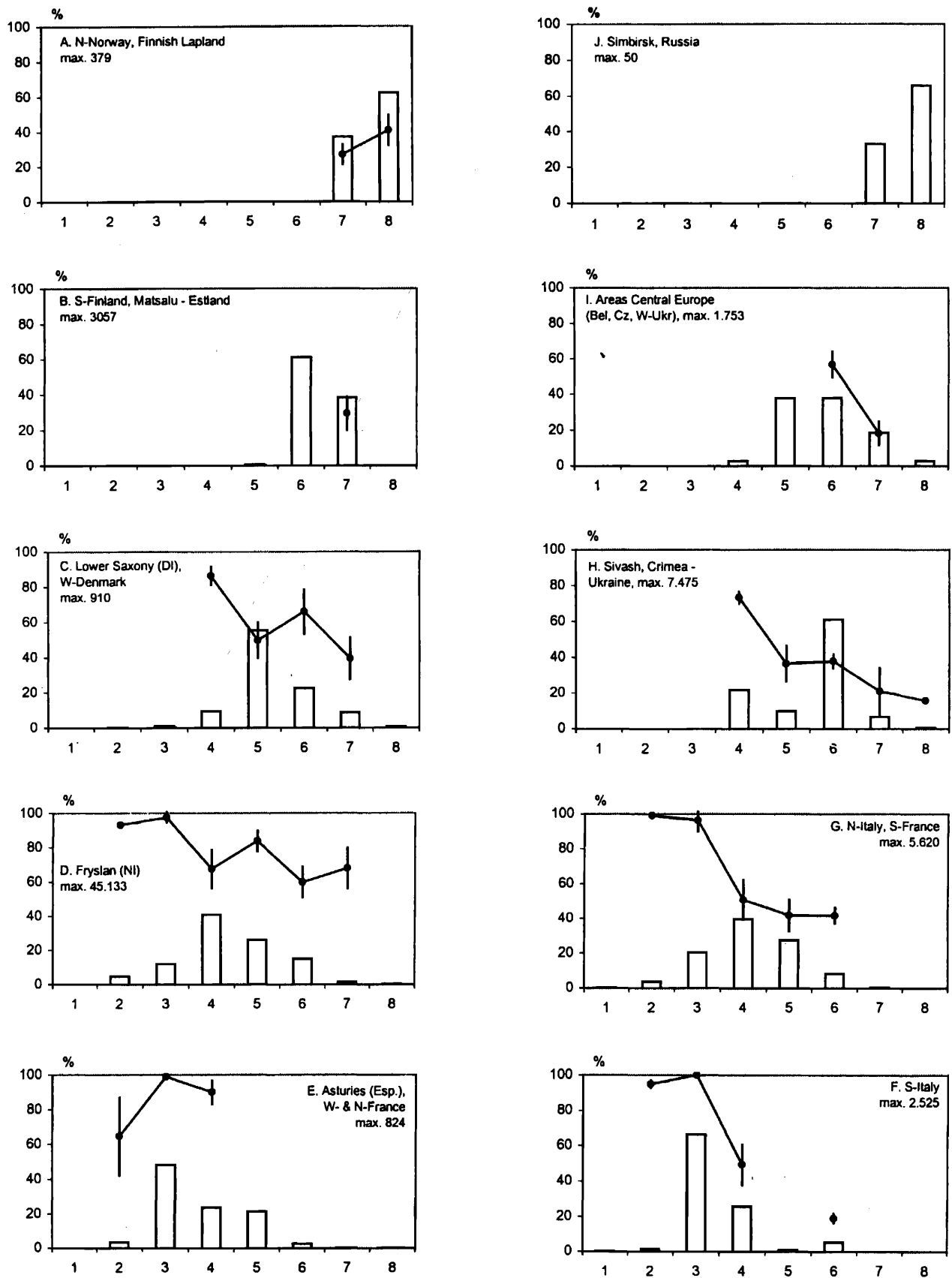


Figure 2. Relative abundance and percentage of males (average \pm s.d.) at different sites in Europe during the spring migration of 1998. Periods 1-8 correspond with Table 1 while the clusters of areas correspond with Figure 1. Periods with less than 50 checked Ruffs have been omitted from the calculations of the percentage of males present.



Table 3. Mean percentage (s.d.) of male Ruffs in spring 1997 at different sites in Europe. In all periods more than 50 Ruffs were checked.

Period	S. Italy		N. Italy & S. France		Fryslân, The Netherlands		Lower Saxony, Germany & west Denmark	
28-30 March	82.8	8.8	68.5	18.7	95.1	2.6	11.9	8.7
11-13 April	13.1	9.6	67.9	20.7	85.5	5.7	67.6	9.6
25-27 April	2.2	6.7	34.2	16.2	60.5	16.5	71.2	17.7
9-11 May	0	0	10	4.5	49.1	16.8	47.1	13.9

beginning of May (Figure 2h-i). At the most easterly site, near Simbirsk, highest Ruff numbers were found at the end of May. So, more or less parallel to the situation in western Europe the timing of migration is related to the position on the migration route: the more to the north or east, the later the peak of migration.

As for Italy, the percentage of males in the areas in central and eastern Europe dropped in the course of spring to about 20% (Figure 2h-i). How representative these figures are is not known, but one must be aware of the small sample size. A study by van Winden *et al.* (1989) in the Eber Gölü in Central-Anatolia (Turkey) confirms a low male percentage during spring migration: they found an overall percentage of 16% males in the first weeks of April 1988 ($n = 663$). Also the other studies in Turkey, Greece and the Sivash report a dominance of reeves (de Nobel 1995, van der Have *et al.* 1992, Schekkerman & van Roomen 1993).

Difference in sex-ratios: There is a remarkable difference between Fryslân and Italy. While the percentage of male Ruffs in Italy dropped quickly to about 40% in April and even lower at the onset of May in southern Italy, the percentage of males in Fryslân remained relatively high. The differences are not an artefact of small sample sizes, since in Italy more than 3,000 individuals and in Fryslân more than 9,000 birds were sexed. In Fryslân the percentage of males dropped in the 4th and 6th census period, probably indicating the arrival of relatively numerous females. The increasing percentage of males in the successive periods (respectively 5th and 7th period) possibly reflects the departure of females. The percentage of males in the Netherlands, Lower Saxony and west Denmark also remained relatively high during migration compared to the figures from Italy in spring 1997 (Table 3). Moreover, Jukema *et al.* (1995) found relative high proportions of males in their catches of Ruffs in Fryslân in 1997 and 1998.

The relative dominance of males in Fryslân is interesting, and several questions arise: are males really in the majority or do females have a higher turnover rate comparing to males? Is there really a lower presence of males in Italy and further east? How do these differences relate to the complicated mating system of the species? Van Rhijn (1991) postulated that reeves may be inseminated during their stay in The Netherlands, depart and subsequently produce fertile eggs on their breeding grounds further to the north and east. An ongoing departure

after copulation (high turnover) would explain the low proportion of females. However, things have changed considerably in The Netherlands since van Rhijn's study (his fieldwork was executed mainly in the late sixties and early seventies). Today, the Ruff is a rare breeding species and lekking behaviour is scarcely observed. Amongst the very large numbers of closely-watched migrants in Fryslân during spring no copulations have been seen, although 'impulsive' displaying behaviour in groups of migrants is not infrequent after the second half of April (own observations, J. Jukema pers. comm). It seems more likely, that males which gain weight in Fryslân migrate to mating grounds elsewhere. These may be situated in Scandinavia and north-west Russia but also in Siberia far to the east (van Dinteren 1987). J. Jukema (pers. comm.) caught a male Ruff in Fryslân on 14 March 1998 and the same bird was recovered on 15 May 1998 in central Siberia, just west of the Lena river. This particular bird was found as a casualty and had travelled 6,662 km after a stop in Fryslân!

FUTURE PLANS

This material has yielded useful information about migration patterns and sex ratios of Ruffs during spring migration. The strength of this project has been the fact that in one season data have been gathered simultaneously at different positions in the migration route. Hitherto, comparative studies and discussions on sex-ratios were of necessity confined to data from different years (e.g. van Rhijn 1991, OAG Münster 1996). It must be stressed, however, that in this project sample sizes from central and eastern Europe are still very small compared to the enormous numbers which pass through these regions.

Given the variations between years in the numbers and morph composition of Ruffs at staging sites (e.g. Jukema *et al.* 1998), it would seem both important and interesting to repeat this survey in a few years time. My goal is to execute a new series of spring counts in 2001 and 2002, roughly to the same guidelines as in spring 1998. In addition to this, there are plans to catch and mark Ruffs in the Inner Niger Delta in Mali. Observation of marked Ruffs via a network of observers is a very effective way of investigating migration routes and turnover rates, as has been demonstrated in several studies (e.g. OAG Münster 1989). The organisation of the next Ruff project will start in the second half of 2000. Anyone who wants to participate, either as a counter or co-ordinator, is invited to contact the overall co-ordinator.



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