

# Migration pattern of Common Snipe *Gallinago gallinago* on Dravsko polje, NE Slovenia

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The migration pattern of common snipe is described for Dravsko polje in northeastern Slovenia based on observations carried out between 1985 and 1998. Spring migration occurred between mid-March and end of April, whereas autumn migration started in July and finished in mid-November. The preferred habitats during migration were drained waterbodies. Almost 50% of flocks consisted of a single bird. Nevertheless, in drained fishponds the average number of birds per flock was 3.1, significantly higher than in other habitats.

## INTRODUCTION

In Europe, wader migration has been studied intensively on the East Atlantic Flyway (Piersma *et al.* 1987), especially that of particular species (e.g. Gromadzka 1987, Piersma 1987, Ens *et al.* 1990, Ens *et al.* 1994). Common snipe *Gallinago gallinago* which occur widely at inland sites throughout Europe during the spring and autumn migration (Cramp & Simmons 1983, Gromadzka 1987) have attracted much less attention. Except for breeding biology (Cramp & Simmons 1983, Green 1988), there is little information about snipe migration (Beintema & Müskens 1982, OAG Münster 1987, 1994), their habitat selection and flocking behaviour, especially in Central Europe. Therefore, the objective of the work described here was to present such data.

## STUDY AREA

This research was carried out in northeastern Slovenia on the Dravsko polje (about 210 km<sup>2</sup>, 46°25'N, 15°45'E), south of the town of Maribor, at an altitude of 238 m to 270 m. Dravsko polje belongs to the sub-Pannonic phytogeographical area (Marincek 1987). The climate is modified continental with a mean annual rainfall of 1000 mm and mean temperature of 8°C (Furlan 1990). The landscape is dominated by agricultural land (about 68%), as well as by forests and woods. The main crops grown are maize, wheat, sugar-beet and potatoes.

The Dravsko Polje is remarkable for numerous man-made waterbodies, i.e. fishponds, gravel- and clay-pits and reservoirs. The most important waters for birds are: Racki ribniki and Turnovi ribniki (fishponds complex), reservoirs Pozeg and Medvedce, gravel- and clay-pits near Pragersko and Hoce (e.g. Vogrin 1996, 1997, 1998a,b,c). Some of these are protected as nature reserves and some of them are included in Landscape Park Racki ribniki – Pozeg. Several water habitats are used for a variety of recreational activities, e.g. fishing, windsurfing, beach walking and, in autumn, shooting. For detailed descriptions of particular waterbodies see Vogrin (1996), Vogrin & Sorgo (1995).

## METHODS

Observations were made between 1985 and 1998. Counts of birds were usually made in the early morning. Observations and habitats were randomly chosen throughout the study. Data from the river Drava (on the border of the study area) are not taken into account in this study. Because the whole study site was not checked on every visit, there can be no doubt that the number of snipes was underestimated.

Flocks of snipe were divided into five categories: one bird, two birds, 3–5 birds, 6–10 birds and >10 birds (see also Vogrin 1998c). Snipes were considered as belonging to the same flock if they were foraging in the same habitat in close aggregation (usually with distances of about 20 m between individuals), responding similarly to different stimuli (e.g. observer, predators, etc.) or changing foraging site in a co-ordinated way. Accordingly, on Race fishponds complex (3 large ponds) flocks were counted for each pond separately.

Habitat types where snipe occurred were divided for further analyses into four categories: dry fishponds and reservoirs (ponds are drained during autumn and/or spring for fish harvesting, and are partly flooded or at least moist), standing waters (reservoirs, gravel- and clay-pits, also ponds filled with waters) canals and streams, arable land (fields, pastures). Since very few birds were observed on running waters this habitat category was omitted from analysis.

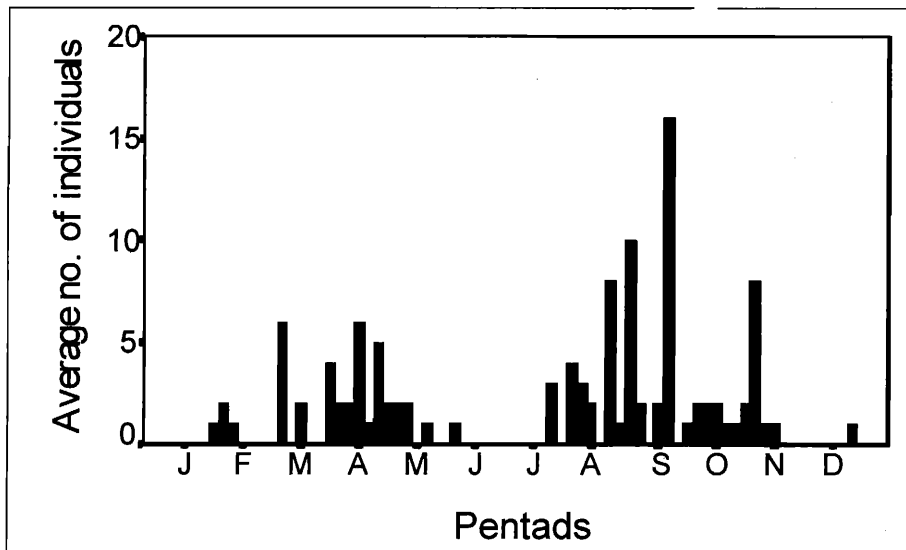
For seasonal patterns, data were grouped in five-day periods (pentads) for which the average values are given in histograms.

Statistics were analysed using SPSS 6.0 statistical package and according to Sokal & Rohlf (1995).

## RESULTS

The first snipes usually appeared in mid-March, but a few individuals arrived earlier (Figure 1). Regular migration started from the end of March or first week of April. Peak numbers occurred in mid-April. The migration normally terminated at the end of April; however some birds occurred as late as mid-May.





**Figure 1.** Migration pattern of Common Snipe *Gallinago gallinago* at Dravsko polje in northeastern Slovenia. Data are grouped into 5-day periods (pentads).

In general, autumn migration was more pronounced than in spring (Figure 1). The first birds appeared in mid-July and the peak period was between the end of August and mid-September. Occasionally, a few birds were recorded in winter.

Single birds were recorded most frequently (Figure 2), the difference between different-sized groups were highly significant ( $\chi^2 = 53.07$ ,  $df = 4$ ,  $p < 0.0001$ ). The largest flock observed on the study area was 16 birds. All detected flocks were monospecific.

During passage, snipes showed a preference for drained fishponds (44.6%), following by standing waters (32.3%), while the remaining habitats were selected sporadically, i.e. arable land (20.0%) and running waters (3.1%),  $n = 130$  (numbers of flocks).

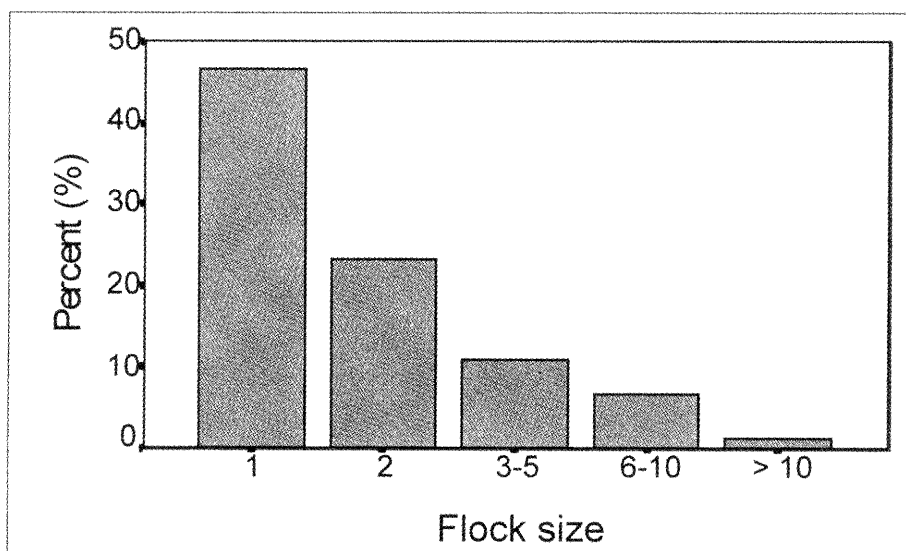
The average numbers of birds per flock was 3.1 in drought fishponds and reservoirs, 2.1 on arable land and 1.3 on stand-

ing waters respectively, these differences were significant (Kruskal-Wallis test,  $\chi^2 = 7.03$ ,  $df = 2$ ,  $p < 0.05$ ).

Differences between spring (February–May) and autumn (August–November) migration in the number of individuals recorded (Mann-Whitney test  $U = 238.0$ ) and different-sized groups (Mann-Whitney test  $U = 241.0$ ) were not significant.

**DISCUSSION**

Most snipes during passage preferred drained waterbodies, i.e. fishponds and reservoirs (see Methods). A similar dependence of snipes on habitat with soft soil is reported by Cramp & Simmons (1983) and Colston & Burton (1988). Ntiamoa-Baidu *et al.* (1998) pointed out that besides availability of food, safe roosting sites and freedom from disturbance (e.g. Ens *et al.* 1990) are also important habitat characteristics for waders. Water depth is one of the key factors for



**Figure 2.** Percent frequency distribution of Common Snipe *Gallinago gallinago* flock sizes during migration on the Dravsko polje (NE Slovenia).



migrant waterbirds through effects on food availability. Therefore, drained waterbodies, mainly fishponds, are very important feeding habitats for snipes. Drying fishponds on Dravsko polje occur during both of the main migration periods for snipe: March–May and September–November. The importance of drained fishponds for various waders during migration is also mentioned by, for example, Rundel & Fredrickson (1981), Bukacinska *et al.* (1996) and Vogrin (1998b,c).

Almost half of the records of snipe in the study area were of single birds. Many waders occur in flocks during migration (Piersma 1997). However, this is less common in snipe (Colston & Burton 1988). According to some authors (e.g. Clark & Mangel 1986, Elgar 1989), flocking behaviour during the non-breeding season reduces the risk of predation and increases the efficiency of foraging. In waders, this is probably an anti-predation strategy (Buchanan 1988, Cresswell 1994). According to my results it seems that this is not true for snipe. The largest flocks were detected in drained waterbodies where the food is more available than in other habitats. It could be that snipe are flocking on these rich food areas and therefore doing so more to increase foraging efficiency than to benefit from reduced risk of predation.

Furthermore, all detected flocks were monospecific. This could be due to the very specific feeding habits of Snipe. On this point it is important to consider that inter-specific competition could also be involved.

In east Austria and in other parts of Central Europe (latitude 45–47°N), autumn migration starts in July with peaks numbers in September–October (Winkler & Herzig-Straschil 1981; OAG Münster 1987, 1994, 1996). Spring migration in Central Europe starts in March, with peak numbers in April. Therefore, the migration patterns of Snipe reported here for northeastern Slovenia are similar to those detected elsewhere in Central Europe.

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