International Waterfowl and Wetland Research Bureau

Woodcock and Snipe Research Group

Newsletter No 21 December 1995

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EDITORIAL

Woodcock (*Scolopax rusticola*), Common snipe (*Gallinago gallinago*), Great snipe (*G. media*) and Jack snipe (*Lymnocryptes minimus*) are markedly different in many respects both from most other migratory birds, and from the wader family they belong to systematically. This was the reason to establish the Woodcock and Snipe Research Group (WSRG) within the RG framework of the International Waterfowl and Wetlands Research Bureau (IWRB) in 1974.

From the beginning members and correspondents of the WSRG as well as IWRB-headquarters were informed on research going on and scheduled, preliminary results, short notes and bibliography on these species by the annual Newsletter.

Organisation

1995 was the year of considerable changes in the organisation of IWRB and hence its research groups.

During the last IWRB board meeting which was held in Malaysia in October 1995, a new global alliance for wetland conservation was created by the integration of three existing international organisations dealing with wetland conservation: the IWRB with operational headquarters in the UK, the Asian Wetland Bureau (AWB, headquarters in Malaysia) and Wetlands for the Americas (WA, headquarters in North America and Argentina).

According to questionaries sent in advance to all board members there was a clear majority for the terms "wetlands" and "international" within the name of the new organisation, which was then called "Wetlands international" (WI). Hence, two important terms that had characterized IWRB as an unique organisation among all the conservation organisations got lost, namely "waterfowl" and "research". Moreover, there is no reference to birds any more in the new logo.

Of course, several coordinators, especially of the taxonomic Research Groups (including the WSRG coordinator) protested against this development, but finally had to give in to the democratic decisions.

The same held for the decision to rename "Research Groups" as "Specialist Groups". So the term "research" disappeared again. However, this decision was taken in order to be consistent with the terminology used by IUCN for their extensive network of groups with similar function as the IWRB Research Groups. In fact, some of them had already acted in both organisations.

WI is now the "Waterbird specialist Group" within the IUCN Species Survival Commission (SSC). The coordinators of each group (and some more people they nominated) are "experts" in the IUCN-SSC and will thus receive all information of this organisation.

This is certainly an advantage. Moreover, the change in terminology clearly does not entail any change in the functions of the groups. Their network will become even more significant in the future to Wetlands International and its regional affiliates. Their experts are essential to provide the organisation with the data, technical information and scientific understanding necessary for the conservation of waterbirds and their habitats.

This means from 1 January 1996 onwards the IWRB Woodcock and Snipe Research Group will be named WOODCOCK AND SNIPE SPECIALIST GROUP of WETLANDS INTERNATIONAL, but there will be no change in the research activities outlined in the triannual plan presented at the board meeting.

Research

Some results of the long-term projects of ONC on the Woodcock in France are summarized in this issue. ONC has further been very active in ringing woodcocks, not only in France but also in Russia and Scandinavia (550 woodcocks had been ringed in Russia alone). A summary will be published in the next Newsletter.

Progress was made in the British project on the Common snipe (this issue). Thanks to the activities of the Norwegian colleagues our knowledge on the Great snipe has remarkably increased (see bibliography).

Wing sampling in Denmark provided insight into the breeding success of woodcock and two snipe species. After the record low in 1992 the age-ratios in this year's wings indicated the highest reproductive success in the 16 years of the study (this issue). In the next Newsletter the results of the intensive wing sampling activities on snipes in France will be published.

Cooperation with the Wader Study Group

During the last board meeting we planned closer cooperation with the Wader Study Group. The coordinator of WSRG was invited to write a brief article on our activities, which will be published in the next issue of the Wader Study Group Bulletin.

Publications

As announced in the last Newsletter we have now access to Russian publications on woodcock and the three snipe species, thanks to the translations of "Merktrans" (Estonia). Some of them are published in this issue, providing not only insight into the main breeding range of these species, but also into the activities of the Russian colleagues. This series will be continued in the following issues of the Newsletter.

The Proceedings of the Fourth Woodcock and Snipe Workshop (Saarbrücken, April 1992) are published as IWRB publication No. 31 and available at IWRB headquarters (price UK £ 12.00).

The Proceedings of the Third Workshop (Paris, 1986) are out of print. Those of the Second Workshop (Fordingbridge 1982) are still available.

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WINTER SNIPE DENSITY AND HABITAT USE IN SW ENGLAND

Andrew Hoodless and Roger Draycott

Introduction

Changes in agricultural practice, in particular the extent of field drainage, throughout Europe have led to recent studies of the habitat use and productivity of common snipe *Gallinago gallinago* during the breeding season (Mason & Macdonald 1976, Beintema & Müskens 1987, Green 1988, Green *et al.* 1990). Breeding snipe in England and Wales have been surveyed with other waders and there is now reasonable information on the main breeding areas and approximate densities of breeding birds at each site (Smith 1983, O'Brien & Smith 1992). Changes in the migration pattern of snipe as a result of habitat loss have also been investigated. Beintema & Müskens (1983) have described the abandonment of traditional Continental moulting grounds, particularly in the Netherlands, and a consequent increase in the number of snipe migrating to Britain.

Snipe are generally believed to be less specific in their habitat requirements in winter, but current information on habitat use is largely anecdotal and the influence of agriculture on wintering snipe has received little consideration. The wintering snipe population in Britain is higher than the breeding population due to the influx of migrant birds from Scandinavia, Germany, Poland, the former USSR and Iceland (Cramp & Simmons 1983), but there are currently no data for snipe densities on farmland. This article describes some preliminary findings from the first year of a two year study of the use of farmland by wintering snipe in SW England. Wintering snipe are widespread in this region (Lack 1986) and shooting bags indicate that some of the highest densities of wintering snipe in Britain are currently found here (Tapper 1992).

Study areas and methods

Snipe densities on winter cereal fields (autumn-sown wheat and barley, n=7, 70ha) and permanent pastures (n=26, 124ha) were assessed on three adjoining farms in Somerset during mid-December 1994 to mid-January 1995. These were compared with density estimates from an area of unenclosed grass moor (56ha) in N Cornwall obtained in late October 1994 and from an area of permanent pastures and grass leys (286ha) in W Cornwall obtained in mid-November to mid-December 1992. The locations of the three study areas are shown in Figure 1.

In Somerset, all fields were searched at least twice on foot at night with a 300,000 CP spot-lamp. Counts were also made at least once during the day, and consisted of first scanning each field with binoculars and then two people walking through the field to flush the snipe. Only nocturnal counts were conducted in the two Cornish study areas.

Six habitat variables were measured in each of the fields in Somerset (Table 1). A relative measure of soil softness between fields was obtained from the mean depth of 20 drops of a pointed metal rod (weight 55g, diameter 4mm) from a height of 1.4m. This measure is referred to as the soil penetrability. The vegetation height in each field

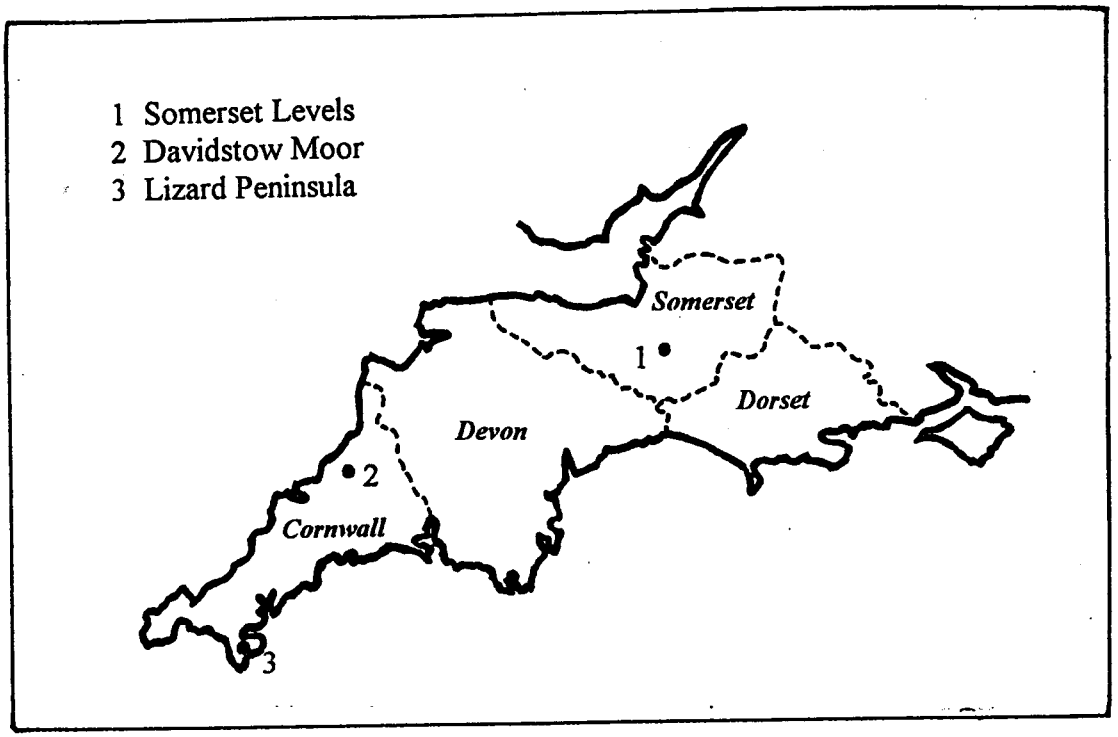

Figure 1: Locations of the three study areas.

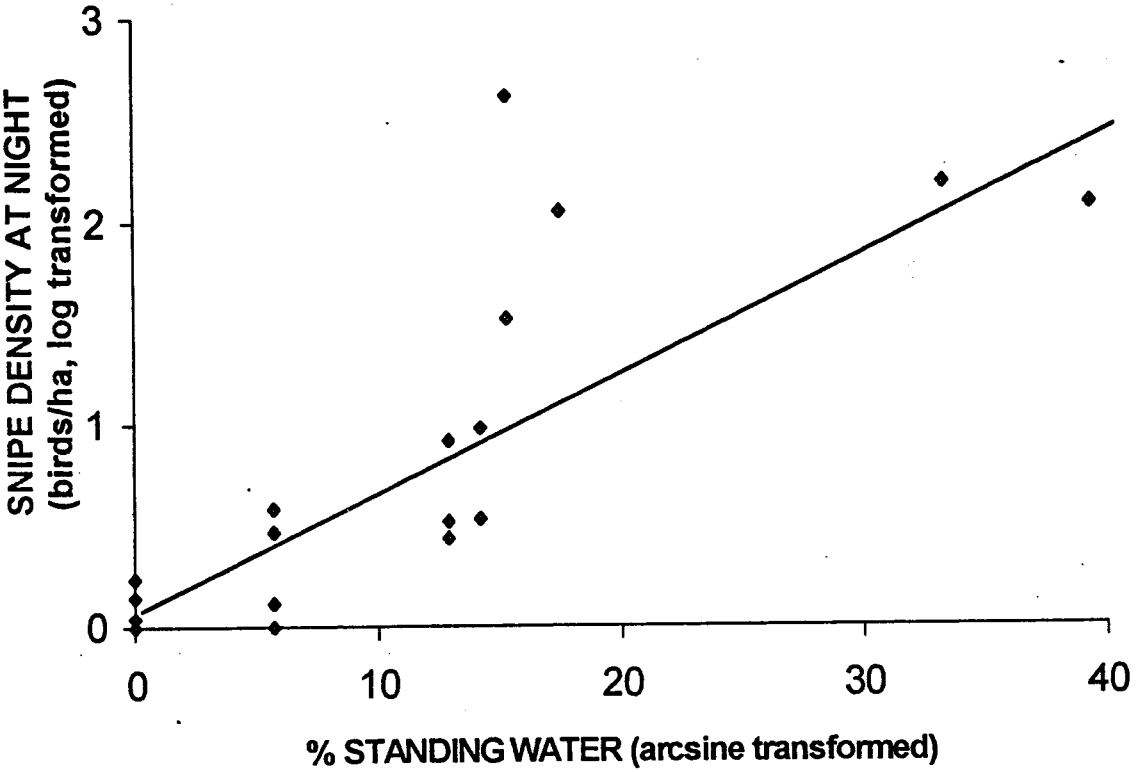

Figure 2: Relationship between the density of snipe on pasture fields at night and the percentage of the field surface covered by standing water, Somerset, January 1995 ($r = 0.85$, $df = 24$, $P < 0.001$).

is the mean of 20 measurements of cereal stem or grass sward height, excluding any patches of rushes.

The relationships between the habitat variables and the day and night snipe densities in Somerset were examined using regression analysis. The number of snipe seen in each field was converted to the density per hectare and transformed to $\ln(x+1)$. The percentages of bare soil and standing water were arcsine transformed.

Results

The mean snipe densities on the two Cornish areas were very similar (77 and 79 birds/km^2), but, as shown by the standard errors, there was appreciable variation in density between fields (Table 2). In Somerset, the mean density on permanent pastures was higher than in Cornwall (173 birds/km^2) but no snipe were seen on the winter cereal fields at night. The overall density in Somerset at night was therefore 136 birds/km^2. Snipe densities will obviously vary during a winter and between winters, but these estimates suggest that wintering snipe densities in SW England currently fall in the range 50-150 birds/km^2.

During the day in Somerset, the snipe visited winter cereal fields and their densities on these fields were comparable with their densities on permanent pastures (83 birds/km^2 and 98 birds/km^2 respectively; t=0.27, df=25, NS). A high density of snipe was also recorded on natural regeneration rotational set-aside fields during the day (193 birds/km^2), but the area searched was very small (13ha). The surfaces of the set-aside fields were relatively compacted (mean penetrability 36mm) compared with those of the winter cereals and pastures (mean penetrabilities 48mm and 43mm respectively), suggesting that the set-aside was not used for feeding by the snipe.

For the pasture fields, there were significant relationships between the density of snipe at night and the percentage of the field surface covered by standing water (r=0.85, df=24, $P<0.001$), the mean depth of standing water (r=0.77, df=17, $P<0.001$) and the mean soil penetrability (r=0.73, df=24, $P<0.001$). Not surprisingly, however, these three independent variables were significantly correlated. The relationship between the density of snipe at night and the percentage of the field surface covered by standing water is shown in Figure 2.

There were no significant relationships between snipe densities during the day and any of the habitat variables in either the permanent pastures or the winter cereal fields. More data from winter cereal fields, however, may reveal a negative relationship with vegetation height, which was close to significance with the present data (r=0.71, df=5, $P=0.072$).

Discussion

Swift (1978) found that snipe fed more frequently at dawn and dusk than during the rest of the day. It seems likely that in Somerset the snipe were feeding mostly at night on the pasture fields. Most of the snipe that remained on the pasture fields during the day were flushed from patches of rushes, suggesting that they were probably resting as opposed to feeding. It is possible that the snipe using the winter cereal fields during the

Table 1. Habitat variables measured in Somerset, January 1995.

Description	Mean ±se	
	Winter cereals (n=7)	Permanent pastures (n=26)
Field size (ha)	10.1 ± 1.9	4.8 ± 0.5
Field surface consisting of bare soil (%)	63.3 ±10.6	7.1 ± 3.9
Field surface covered by standing water (%)	0.0 ± 0.0	4.8 ± 1.9
Mean depth of standing water (cm)	0.0 ± 0.0	3.6 ± 1.3
Mean soil penetrability (mm)	47.6 ± 1.9	43.0 ± 1.2
Mean vegetation height (cm)	11.5 ± 0.7	14.3 ± 0.4

Table 2. Estimated snipe densities in three areas in SW England.

Study area	Fields	Area searched (ha)	Snipe density (birds/km²) ±se	
			Night	Day
Lizard Peninsula, W Cornwall	41	286.3	76.7 ±24.4	
Davidstow Moor, N Cornwall	4	56.1	79.3 ±20.2	
Somerset Levels				
Permanent pastures	26	123.9	173.0 ±63.1	98.3 ±30.0†
Winter cereals	7	70.4	0.0 ± 0.0	83.3 ±36.3

† The density of snipe on permanent pastures during the day is based on counts of 20 fields, 83.2ha.

day were feeding and that these fields were visited because they enabled the snipe to detect predators earlier than on pasture fields. We intend to investigate this hypothesis during the winter of 1995/96.

Surface water clearly makes pasture fields more attractive to feeding snipe. This is not surprising because waterlogging of the soil will force many invertebrates, particularly earthworms, to the surface, as well as making it easier for the snipe to probe. Obviously, the depth of the standing water is likely to affect the success with which snipe can feed, and prolonged severe flooding where the depth of water exceeds 6-7cm will prevent snipe feeding altogether.

The area of set-aside searched during the first year of this study was too small to enable us to predict whether this habitat is likely to be of widespread benefit to wintering snipe. Nevertheless, in a recent RSPB study comparing the use of rotational set-aside and winter cereal fields by birds during the day, both the frequency with which fields were used by snipe and the number of birds present were significantly greater for set-aside fields (Wilson *et al.* 1995).

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MANAGING SNIPE HABITATS

Guy - Noël Olivier

Wintering habitats for Common snipe (*Gallinago gallinago*) and Jack snipe (*Lymnocryptes minimus*) are continuously declining throughout Western Europe since decades. Snipe marshes are endangered in two ways, namely

- by drainage for agriculture, and
- by a change in cattle breeding.

In order to raise the meat price cattle is increasingly kept in stables. Marshes not grazed any more are quickly covered by high vegetation and invaded by bushes and trees - and snipes disappear.

In order to maintain marshes as snipe habitats cattle grazing must be substituted by mechanical maintenance.

For more than 40 years we have successfully managed marshes in the coastal plains of Picardie in Northern France. Though the main initiative for those activities was the interest in hunting snipes, it was the strongest incentive to keep the habitats for these marvellous birds.

Proper management requires the following procedure:

Water control

Wet meadows are essential for snipes. Since we can not depend on rainfall, which is usually insufficient in August, September and October, it is necessary to artificially flood the area. Management of the vegetation also requires control of the water level.

Mowing and burning

In March and early April the spots to be managed are marked with poles. We do it in a rotating system, so the same spots are never managed in two consecutive years.

In the beginning of May, after the birds have left for home migration we drain the marsh to regenerate vegetation.

By mid-June pathways are cut, about 2.50 m wide. The marsh is then covered with a network of winding tracks that are used year for year (if soil permits) for the work with the tractor as well as for hunting.

In July the vegetation is cut on square or oval shaped areas, irregularly placed along the tracks and around the spots marked in spring.

Some days after mowing the litter is burnt on the spot during dry weather. Then the swamps are flooded, and the first snipes will use them immediately.

Whenever the height of the vegetation exceeds 20 cm the area is drained for mowing and then reflooded - on average about every twenty days - until the end of October. To manage 250 places this way means a heavy load of work!

Finally, at the end of the hunting season, in January and February all visible sprouts of bushes are removed, dikes controlled etc. After having tested all

available machines for vegetation management we at last opted for the gyro-grinder equipped with a cutting propeller that grazes the area without doing harm to the ground and the marshy vegetation carpet.

Advantages and disadvantages

Mechanical maintenance as described above may be not ideal in some respects. It is costly and time consuming, and the fertilization of the soil by cattle manure in favour of the microfauna is missing. On the other hand the habitat is managed exactly for the requirements of the snipes, i.e. for foraging, roosting, preening or hiding. We further have the chance to irrigate the area just for the snipes, which is usually not possible in cattle grazing areas. And finally, except for the hunting days, there is no disturbance any more.

In conclusion, since only a third of this region is still grazed by cattle, mechanical maintenance is no more a choice but a necessity. Conservation of wetlands is a big problem, but to maintain them as suitable habitats is not less of a task. Snipe hunters are nowadays the "gardeners" of their natural environment.

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SOME OBSERVATIONS ON WOODCOCK (*SCOLOPAX RUSTICOLA*) MIGRATION IN AUSTRIA AND WESTERN HUNGARY IN 1994

Philipp Meran

Spring migration: Some first migrants have been recorded in southern regions already since 1st of March. South of Graz, near Grambach a smaller group was dwelling from about March 9 to 14. In the Hungarian districts of Somogy, Tolna, Baranya and Zala larger amounts of woodcock did not appear before 12 March. In the more arid Austrian regions of Klingenbach, Siegendorf and Zagersbach, where they usually arrive early, they came not before March 10, while near Bobersdorf, Luising and Strem woodcocks were seen frequently after March 7. Altogether 40 evenings have been spent for woodcock observations.

The following woodcocks bagged mainly during evening flights in spring 1994 were analyzed:

Date	Time	Location	Age	Sex	Weight (g.)	Bill length (mm)	Total number seen
15.3.	evening	Ujvárfarlva	juv.	♂	300	65	5
16.3.	evening	Ujvárfarlva	juv.	♂	318	72	3
17.3.	evening	Ujvárfarlva	ad.	♀	325	68	8
17.3.	evening	Ujvárfarlva	juv.	♂	315	70	
18.3.	morning	Keresztur	juv.	♂	300	69	4
20.3.	evening	Ujvárfarlva	juv.	♀	295	62	3
24.3.	evening	Ujvárfarlva	ad.	♂	315	74	6
26.3.	evening	Ujvárfarlva	juv.	♂	285	70	5
29.3.	evening	Buzsák	juv.	♂	325	71	2
11.4.	evening	Weissenkirchen	juv.	♀	240	63	2
11.4.	evening	Weissenkirchen	ad.	♂	220	66	
17.4.	evening	Weissenkirchen	ad.	♂	265	76	3

The last three birds taken during a period of snow cover were very lean.

Fall migration: This was the most intense and protracted fall migration since many years. At the observation areas Rosenkogel, Reinischkogel, Stainz, Grambach some woodcock showed up at the end of September already, even in the lowlands. Probably due to the mild weather they were seen until December 10; the moderate cold-spell from 5 to 8 October obviously had not affected them. During altogether 38 evenings observed record numbers at least since a decade were counted.

The following woodcocks were bagged in Austria (Steiermark) during evening flights in fall 1994.

Date	Time	Location	Age	Sex	Weight (g.)	Bill length (mm)	Total number seen
12.10.	evening	Grambach	ad.	♀	360	74	2
18.10.	evening	Grambach	juv.	♂	335	76	4
23.10.	evening	Rosenkogel	ad.	♂	340	75	7
23.10.	evening	Rosenkogel	juv.	♂	348	65	
23.10.	evening	Rosenkogel	juv.	♀	295	70	
6.11.	evening	Gasselsdorf	juv.	♂	370	71	4
7.11.	evening	Grambach	ad.	♂	395	76	3
10.11.	evening	Stainz	juv.	♂	345	71	3
4.12.		Gleichenberg	ad.	♀	335	68	4

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ITALY - WOODCOCK SYMPOSIUM IN BOLOGNA

Silvio Spano

In the afternoon of February 10, 1995, during the 3rd National Meeting of Game Biologists (organized by the Instituto Nationale por la Fauna Selvatica) woodcock (*Scolopax rusticola*) experts met for an exchange of experiences. The coordinator of the WSRG, Herby Kalchreuter, who couldn't attend the meeting, was represented by Silvio Spanó.

Management

Charles Fadat of the ONC, France, summarized his ideas on woodcock management under the following criteria:

- Geographic variations of woodcock densities, based on the estimates of roding males and other abundance indices,
- mortality rates calculated from ringing data,
- bag statistics,
- estimates of hunting pressure, calculated from the time lag between ringing and recovery,
- fidelity to breeding and wintering sites

Data collection on these items over time would allow to document among others variations in the extension of the woodcock range, as well as in survival rates.

Furtheron, Fadat suggested to establish hunting free zones during cold spells, especially along shores.

DNA analyses

Bruno Burlando (Universita de Terine) Attilio Arillo and Silvio Spano (Universita de Terine) reported on first results of their analyses of DNA in the woodcock - an attempt to investigate possible genetic variation in different European woodcock populations by using random amplification of polymorphic DNA (RAPD). From the different regions a total of 39 livers preserved in ethanol were analyzed (17 from Sweden, 14 from northern Italy and 8 from Turkey). Extracted DNA was amplified by PCR using 10-mer primers and the products were tested by electrophoresis. A total of 71 bands were scored for band-sharing analyses. In a working hypothesis bands were considered as characteristics of presence-absence, in order to build a pairwise similarity matrix and an UPGMA dendrogram. Clustering of the samples under this respect revealed an almost complete separation of woodcocks from Turkey and Sweden, while the samples of Italy showed affinities to those from Turkey as well as from Sweden. While non-metric measures of genetic distances as well as metric measures indicated that Italian samples were more similar to those of Sweden than to the Turkish ones. Thus the RAPD data are more or less consistent with recent knowledge on migration routes derived from recoveries of ringed birds.

The authors expressed their thanks for V. Marcström and L. Turetta for providing the woodcock livers.

Ringing

Pierfranco Ruda and Guiseppe Landucci, gamekeepers in the region of Rome reported on their ringing activities. In fall/winter of 1992/93 and 1993/94 a total of 262 woodcock were ringed, which resulted in 13 recoveries so far (5 from the locality of ringing, 4 from other Italian regions, 1 from Russia, 2 from Hungary, and 1 from former Yugoslavia).

After Silvio Spanó developed his ideas of woodcock management based on research results the group unanimously adopted a recommendation on that matter. It was primarily adressed to those countries that exploit wintering woodcocks economically by tourist-hunting, with an appeal to control harvest especially during periods of critical climatic conditions.

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WING SAMPLING IN DENMARK - SEASON 1994/95

Since 1979 wings of waterfowl, snipes and woodcock bagged by Danish hunters are sampled by the National Environmental Research Institute, Kalø. The DMU report No. 137, edited by Ib Clausager provides the following results:

Woodcock (*Scolopax rusticola*)

525 wings received revealed a ratio of 2.7 young per adult bird. This is the highest ratio since the beginning of these studies, indicating an extremely successful breeding season.

Woodcock migration through Denmark peaked in the first half of November.

Common snipe (*Gallinago gallinago*)

With 556 wings received the number has almost doubled compared with the previous season. The ratio of 5.2 young per adult is one of the highest since the beginning of the study on snipes 16 years ago, indicating a very good breeding success.

Most snipes were bagged in September, with a smaller peak in the second half of October.

Jack snipe (*Lymnocryptes minimus*)

80 wings of this species have been sent in, the second highest number in 16 years. Since there are no distinct age criteria known so far, no age-ratios could be calculated. However, the relatively large number harvested points to a good breeding season of this species as well.

The seasonal distribution of the wings point to a peak of migration in the first half of October, thus about one month later than the Common snipe.

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RAPPORT BECASSE - CROULE 1995

Yves Ferrand

Comme chaque année depuis 1988, vous trouverez dans les résultats des observations de croule réalisées en France au cours du printemps-été 1995.

Le nombre d'années de récolte de données est désormais suffisamment important pour estimer, avec un degré de confiance acceptable, la tendance démographique de la population de bécasses nichant en France. L'objectif de ce travail est donc atteint. Une nouvelle période s'amorce, celle du **SUIVI PATRIMONIAL** destiné à renseigner le plus précisément possible les gestionnaires, mais aussi les pouvoirs publics, sur l'état des populations.

Nous devons désormais maintenir notre vitesse de croisière et ainsi jouer un rôle essentiel dans la gestion des populations de bécasses.

Nos remerciements, et nos encouragements, vont à tous les observateurs du réseau pour leur collaboration efficace.

Resultats

1 - Taux de réalisation

Au total 60 départements ont été sollicités. Cinquante neuf ont pu mener à bien les observations. Cette année les départements de la Haute-Garonne, de la Manche et du Pas-de-Calais ont rejoint le réseau d'observateurs de la croule.

Près d'un millier (987) de sites ont été visités. Une telle pression d'observation assure à ce travail une bonne fiabilité statistique.

2 - Taux d'occupation national

Ce taux correspond au pourcentage de sites sur lesquels la présence de bécasses à la croule est notée.

* Pour l'année 1995, le **taux d'occupation global** (Tg) s'élève à **0,276**.

Cette valeur est l'une des plus fortes des sept dernières années. Seule celle de 1990 la dépasse (0,281).

Années	1988	1989	1990	1991	1992	1993	1994	1995
Tg	0,259	0,247	0,281	0,236	0,270	0,255	0,241	0,276

Si l'on compare les résultats obtenus pendant huit années sur les mêmes départements (n = 21), aucune différence significative du taux d'occupation global n'apparaît [Z = 6,46 < 14,07 (P = 0,05)]. La surface forestière occupée par les bécasses à la croule n'a donc probablement pas variée de 1988 à 1995.

Une analyse plus détaillée de cette tendance est présentée à fin ce rapport.

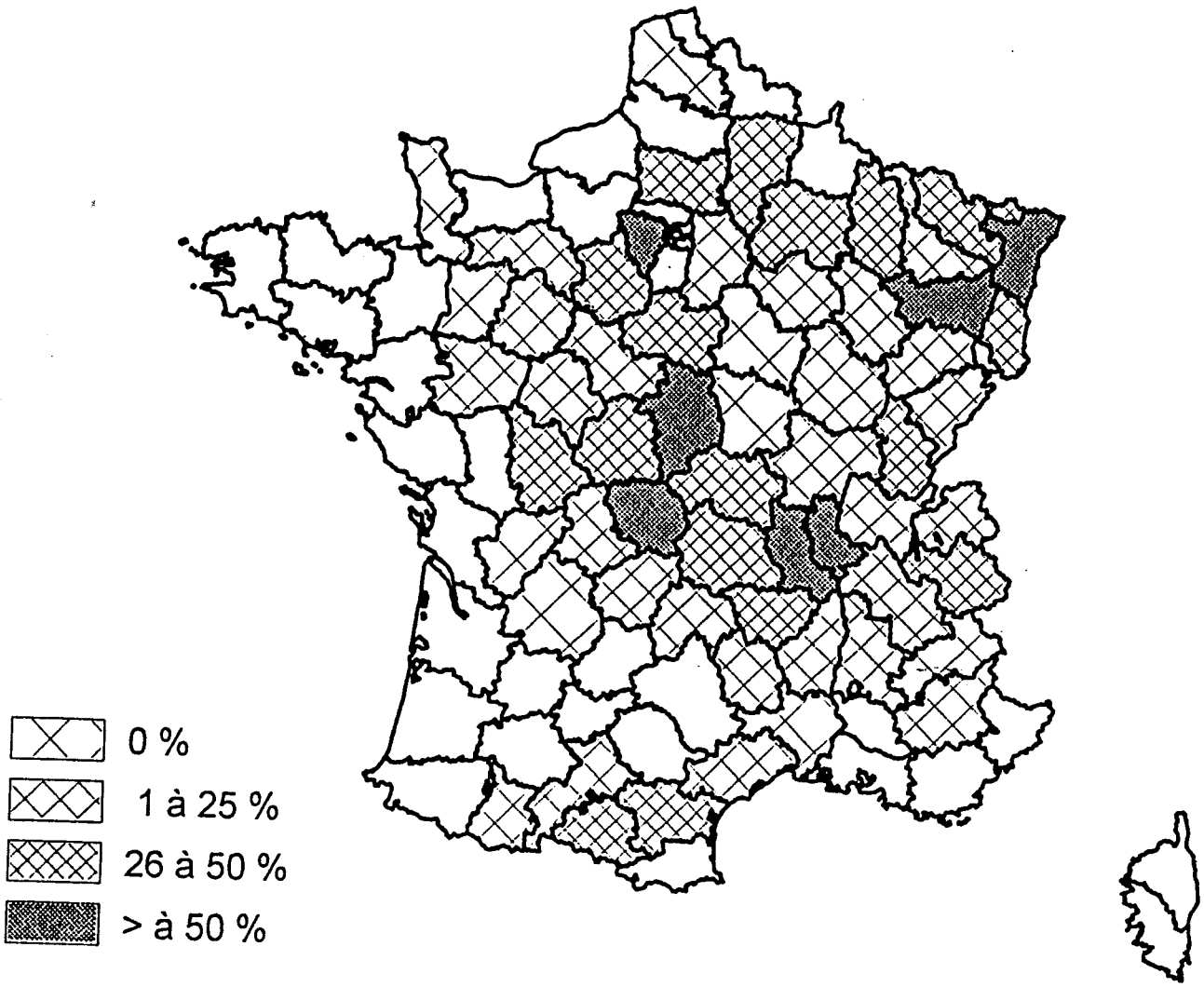


Figure 1: Localisation des départements qui ont participé au suivi en 1995 et taux d'occupation pour chacun d'eux.

* Le taux d'occupation des sites à fortes abondances (TF) s'élève à 0,085. Rappelons que sur ces sites le nombre d'observations est ≥ 5.

* Le taux d'occupation des sites à faibles abondances (Tf) est égal à 0,19. Sur ces sites le nombre d'observations est compris entre 1 et 4.

Départements	Sites positifs	Sites sans obeervations	Nombre de contacts aux sites positifs	Taux d' occupation
1	4	19	4,4,2,1	0,17
2	5	5	13,12,9,4,2	0,50
3	4	6	11,5,1,1	0,40
4	1	16	5	0,06
5	0	15	-	-
7	2	13	4,4	0,13
9	3	8	3,2,2	0,27
10	2	8	2,1	0,20
11	6	11	4,3,2,1,1,1	0,35
15	1	9	1	0,10
16	0	10	-	-
18	8	6	11,6,4,2,2,2,2,1	0,57
19	3	9	3,2,1	0,25
21	4	30	3,2,2,1	0,12
23	7	4	4,3,2,2,1,1,1	0,64
24	0	31	-	-
25	2	23	4,1	0,08
26	1	27	1	0,04
28	7	8	5,4,2,1,1,1,1	0,47
30	0	12	-	-
31	1	19	3	0,05
34	3	18	2,1,1	0,14
36	4	7	2,1,1,1	0,36
37	4	43	6,5,2,1	0,085
38	5	20	6,4,3,2,1	0,20
39	12	20	18,14,12,10,8,4,3,2,2,1,1,1	0,375
41	6	19	8,7,3,2,2,1	0,24
42	9	6	29,13,7,5,5,5,5,4,3	0,60
43	7	7	8,5,5,1,1,1,1	0,50
45	10	12	13,11,7,6,6,3,3,2,1,1	0,45
48	3	13	7,5,3	0,19
49	2	8	9,3	0,20
50	0	6	-	-
51	10	10	8,5,5,3,3,2,2,2,1,1	0,50
52	3	24	2,1,1	0,11
53	0	17	-	-
54	2	10	3,2	0,17
55	4	8	5,4,3,2	0,33
57	5	9	6,4,1,1,1	0,36
58	0	15	-	-
60	14	14	11,7,6,5,4,4,3,3,2,2,2,1,1	0,50
61	3	9	2,1,1	0,25
62	1	18	1	0,05
63	6	9	18,6,3,3,2,2	0,40
65	2	8	1,1	0,20
67	20	5	17,11,9,6,6,3,3,3,3,2,2,2,2,2,2,1,1,1,1,1	0,80
68	6	8	9,4,2,2,2,1	0,43
69	9	5	12,9,8,7,6,5,3,1,1	0,64
70	2	12	17,2	0,14
71	1	7	2	0,125
72	2	14	4,2	0,125
73	6	9	17,15,9,3,3,2	0,40
74	4	16	5,3,2,1	0,20
77	1	10	1	0,09
78	4	3	22,8,3,2	0,57
86	5	11	5,4,3,2,1	0,31
87	1	5	5	0,17
88	9	4	11,7,6,4,4,2,1,1,1	0,69
89	0	13	-	-
TOTAL	246	741		

Tableau 1: Detail des resultats croule 1995 par département

3 - Taux d'occupation régional

Comme l'an passé, nous avons distingué huit régions. Les résultats sont présentés dans le tableau ci-dessous.

Régions (nombre de départements pris en compte)	Taux d'occupation
Alsace (2)	0,653
Lorraine (4)	0,480
Massif Central (13)	0,282
Bassin Parisien (18)	0,253
Franche-Comté (3)	0,195
Pyrénées-Languedoc-Roussillon (6)	0,178
Alpes (7)	0,153
Bourgogne (3)	0,080

L'Alsace arrive toujours en tête. Dans cette région, il y avait, cette année, deux chances sur trois d'observer une bécasse à la croule en se postant au hasard, le soir, dans une forêt alsacienne! L'écart à la hausse le plus élevé par rapport à 1994 se situe en Lorraine. Le Massif Central présente une légère hausse et la Franche-Comté accuse une chute sensible. Ailleurs on observe une quasi stabilité de cet indice.

4 - Analyse de la tendance démographique

Les résultats présentés ci-après ont fait l'objet d'un poster scientifique à la Conférence Internationale «Bird Numbers 1995», consacrée aux méthodes de recensement d'oiseaux et à l'interprétation des données qui en résultent.

Les tendances démopraphiques ont été analysées sur 3 périodes différentes:

- 7 années, de 1989 à 1995
- 6 années, de 1990 à 1995
- 5 années, de 1991 à 1995.

Dans la mesure où l'enquête s'est mise en place petit à petit, plus la période d'analyse est longue moins la couverture géographique est étendue et moins le nombre de sites d'observations est grand.

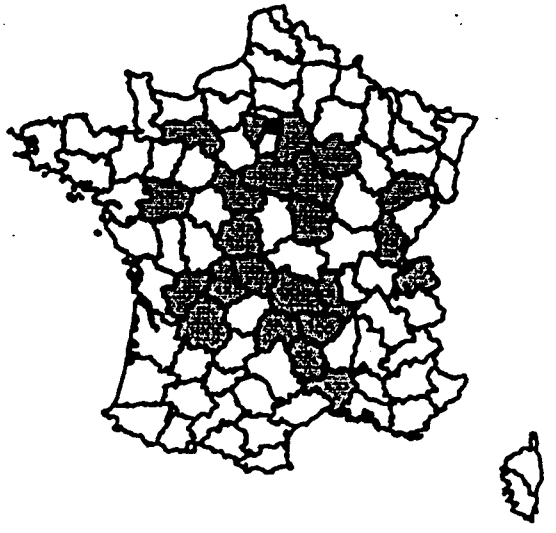
1989 à 1995

L'analyse repose sur 23 départements qui ont participé au suivi, sans discontinuité, depuis 1989. Le nombre de points d'écoute visités chaque année est présenté dans le tableau ci-dessous.

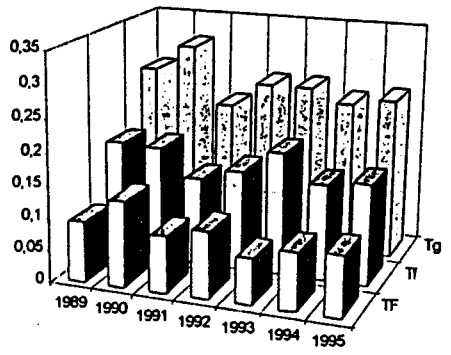
Année	1989	1990	1991	1992	1993	1994	1995
Nombre de points d'écoute	300	326	332	329	337	338	340

Les variations inter-annuelles du taux d'occupation globale (Tg), du taux d'occupation des sites à faibles abondances (Tf) et à fortes abondances (TF) sont présentées dans les figures suivantes ainsi que la couverture géographique correspondant à la période analysée.

Couverture géographique de 1989 à 1995



Variations inter-annuelles de Tg, Tf et TF



Un test de χ^2 a été appliqué à ces données. Deux tendances ont été testées, celle du taux global d'occupation et celle du rapport du nombre de sites à faibles abondances sur ceux à fortes abondances.

Pour Tg, $\chi^2 = 8,00 < 12,59$ ($\alpha = 0,005$)

Pour Tf/TF, $\chi^2 = 5,71 < 12,59$ ($\alpha = 0,05$)

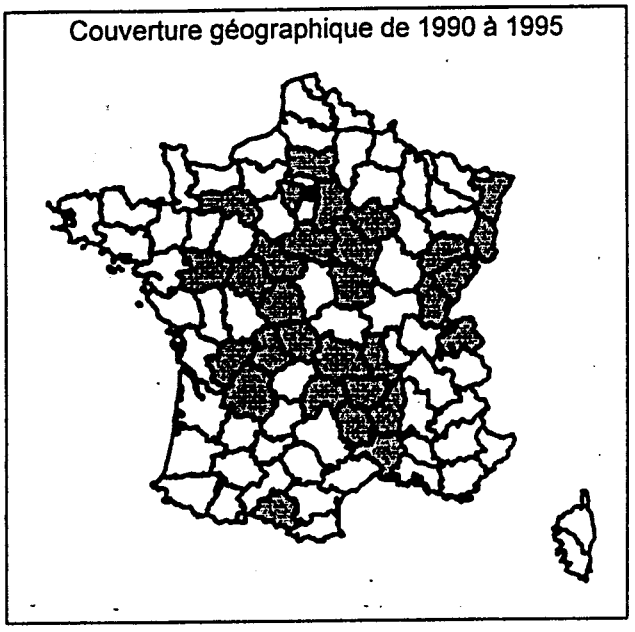
Aucune tendance n'est mise en évidence. La surface occupée par les bécasses à la croule et le rapport entre les sites à fortes et à faibles abondances n'ont globalement pas varié depuis 1989.

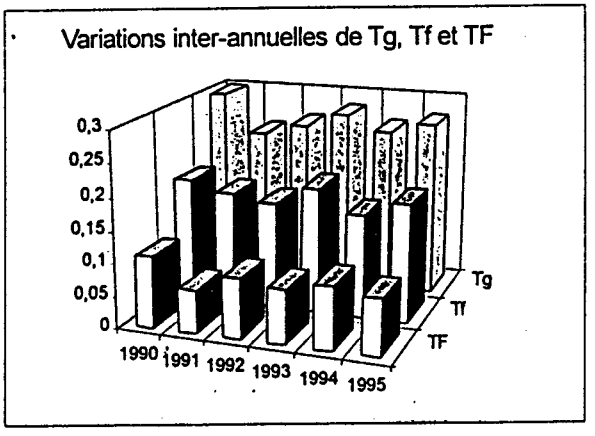
1990 à 1995

L'analyse repose sur 30 départements, selon le même critère que pour la période précédente. Le nombre d'écoute visités chaque année est présenté dans le tableau ci-dessous.

Année	1990	1991	1992	1993	1994	1995
Nombre de points d'écoute	473	471	471	481	476	505

La figures suivantes présentent la couverture géographique de 1990 à 1995 et les variations inter-annuelles de Tg, Tf et TF.





Le test de χ^2 donne les résultats suivants:

- pour Tg, $\chi^2 = 5,36 < 11,07$ ($\alpha = 0,05$)
- pour Tf/TF, $\chi^2 = 4,60 < 11,07$ ($\alpha = 0,05$)

Aucune tendance n'est décelée.

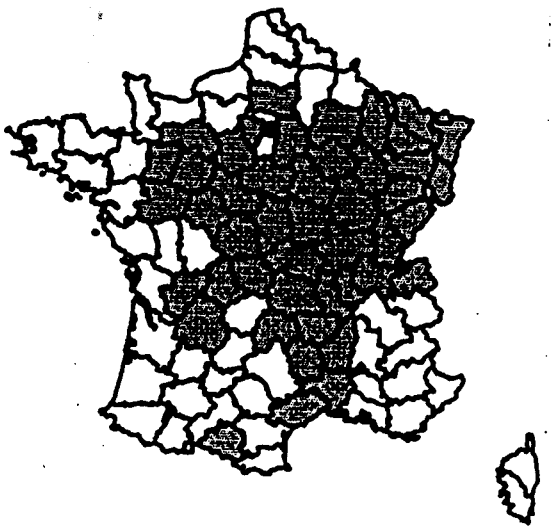
1991 à 1995

L'analyse concerne bien entendu plus de départements puisque 46 ont pu être retenus. Le nombre de points d'écoute est également plus élevé comme le montre le tableau ci-dessous.

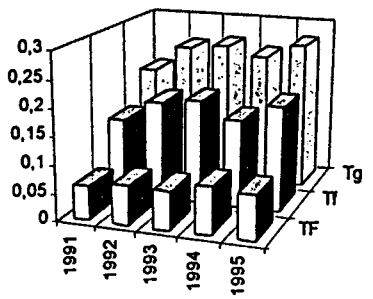
Année	1991	1992	1993	1994	1995
Nombre de points d'écoute	723	722	734	739	775

La couverture géographique et les variations inter-annuelle de Tg, Tf et TF pour les cinq dernières années sont présentées ci-après.

Couverture géographique de 1991 à 1995



Variations inter-annuelles de Tg,Tf et TF



L'analyse statistique donne:

- Pour Tg, $\chi^2 = 9,94 > 9,49$ ($\alpha = 0,05$)
- Pour Tf/TF, $\chi^2 = 3,13 < 9,49$ ($\alpha = 0,05$)

Une faible hétérogénéité est mise évidence dans les variations du taux d'occupation globale des cinq dernières années. En l'occurence il s'agit d'une légère hausse. En revanche, le rapport des faibles aux fortes abondances demeure stable. Statistiquement ce résultat n'est pas étonnant compte tenu de la période de calcul réduite et de la taille plus grande des échantillons annuels.

5 - Nidification

Très peu de nids ou nichées nous ont été signalés cette année.

- Dans le Doubs, trois bécasseaux âgés de quelques jours ont été bagués le 26 juillet sur la commune de Mouthe.
- Dans l'Indre, quatre bécasseaux ont été vus avec leur mère le 6 avril, au lieu-dit « La Petite vente » sur la commune d'Heugnes.
- Dans le Rhône, un nid de quatre oeufs a été découvert le 18 mars sur la commune de Létra. Deux bécasseaux, sur les trois éclos, ont été bagués le 7 avril.

CONCLUSION

A partir des indices dont nous disposons et de l'interprétation que nous en faisons, les effectifs de bécasses présents en France en période de reproduction sont très probablement restés stable de 1987 à 1995. Peut-être une légère augmentation est-elle apparue au cours des cinq dernières années.

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SUMMARY

Report on woodcock (in France) - roding season 1995

In order to get at least an idea of the woodcock (*Scolopax rusticola*) population breeding in France, suitable habitats have been investigated for roding males since 1988. In 1995 60 departements have been covered (Fig. 1) and 987 sites were investigated (Tab. 1).

Analyses of the results of three periods (1989 - 95, 1990 - 95, 1991 - 95) revealed a more or less constant trend in the rate of sites occupied by roding woodcocks. Of the eight regions distinguished, Alsace always exhibited the highest rate of occupation.

In contrast to earlier years, only three records of nesting woodcock were reported in 1995.

H. K.

ON WOODCOCK AND SNIPES IN THE FORMER USSR

Thanks to the political changes we have now access to the colleagues working in the main breeding range of all four species. Most of their publications are in Russian only. But the translation bureau "Merktrans" of J. Shergalin in Estonia provided an extensive list of literature of this century, and also translated the following articles I had selected for this issue. This series will be continued during the next years.

I also want to express my thanks to the International Council for Game Conservation (CIC) for taking over the costs of these activities.

H. K.

Antipov, A. M., Yu. Yu. Blokhin & A. Yu. Blokhin: The Woodcock in some regions of the Middle Ob River basin. Voprosy Ornitologii [Problems of Ornithology]. Abstracts of the Vth Conference of Ornithologists of Siberia. Barnaul, 1995. P. 87. In Russian.

In May-June 1980-81 we conducted bird census from board of a boat travelling with a speed of 3.5 km/hour on the Seul'River (left tributary of the Ob'River) and the Mulym'ya (left tributary of the Konda River). The Seul'River valley is situated amid marshes, above-flood terraces are occupied by mixed forests, with considerable cleared spaces. The controlled plot of about 25 km is an intensively meandering part of the river.

On 11 June 1980 at 19.00 one bird was sighted. On the next day 12 birds were recorded during 7 hours. The first bird was sighted at 16.32; then from 18.43 till 20.22 10 birds crossed our route, among them 3 birds with 1 minute interval. The last bird was observed at 22.48. Birds flew at a height of 40 m over higher trees with typical "tsyrk"-voices.

On 10 June 1981 in lower parts of the Mulym'ya River 2 Woodcocks were recorded on young birch-groves on cleared places and galdes.

At the end of 1984 a female was shot in the M. Yugan River flood not far from the Ugut settlement - the only sighting for weeks.

At the first decade of May 1987 at 3 km north of the Khanty-Mansijsk we heard one bird at about 22.00 h. Later, the forest areas between Irtysh and Ob River floods were studied at a distance from 2 to 15 km from town. Here till 1994 2 - 14 birds were registered roding each spring, up to 3 birds simultaneously.

Dyatlov, A. I. : How the woodcock carries chicks from one place to another. Nature, 1951. No. 8. P. 49.

Woodcock (*Scolopax rusticola*) in case of danger for their chicks , carries them on short distances to hide them from the enemy. This widely well-known fact was described by M. A. Menzbier in 1895 ("Birds of Russia", vol. 21, page 210). In 1909 in his new work ("Birds ") the same author has included a figure, showing a flying woodcock by with chick, clutched between the toes, legs stretched down. Afterwards, in ornithological literature repeatedly cases were published, confirming this phenomena. But just method, by which the woodcock holds the burden during flight, was left unclear. I could conduct some observations in contrast to M. A. Menzbier´s description.

On 16 May 1950 around 10 a.m. I walked in the Losinoostrovskoe hunting area over a plot of sufficiently cluttered up aspen/fir-forest with undergrowth of honey-suckle, "beresklet" (*Evonymus europaea*) and alder. Suddenly a woodcock took off just in front of my feet. The bird lifted heavily, strongly flapping its wings. It kept a chick between the tarsuses (not between toes!), the legs slightly tucked in clasped the chick towards the belly. The head and the fanelled tail were slightly bent down. The woodcock flew low over the shrub and after a distance of about 15 m it landed with its burden on the ground. Then it came back for the second chick that was hiding near my feet. The woodcock several times passed me closely, whistling and hissing. I caught a chick that had tried to run away. It was about one week old and already grown up to a weight of 64.9 g, which is about one quarter of the adult weight.

Danilov, P. I. : Numbers of Great Snipe (*Gallinago media*) and Woodcock (*Scolopax rusticola*) in Karelia during autumn passage. Ornithology in the USSR. In 2 vol. Ashkhabad, Ylym. 1969. Book 2. Pp. 184 - 186.

In 1963 - 1968 census of Great Snipe and Woodcock was conducted with gun-dog on the autumn passage in Karelia. The Great Snipe was counted on the fields in the Shuya river floods (Shuiskie fields) from 1 till 25 September on an area of 50 - 60 ha, Woodcock from 1 till 30 October on constant routes, with a total length of 18 - 20 km. During these periods census was repeated 4 - 5 times. Only birds flushed once were counted. The average-year data of one census were calculated on the base of three days of maximum number of flushed birds.

Censuses were conducted at the time of passage of these species in Karelia, for the Great Snipe in September, for the Woodcock in October. Migration dates varied annually in the order of 5 - 7 days, dependent on weather conditions. The most intensive passage of the Woodcock is at the end of the first - through the second decade of October. The maximum number of flushed birds per day was 36 Great Snipes (09. 09. 1967), and 17 Woodcocks (16. 10. 1966). The latest dates of shooting was 5 October for Great Snipe and 10 November for Woodcock.

Average-year data (see above) varied from year to year:

	1963	1964	1965	196	1967	1968
Great Snipe	15.5	13.7	3.0	9.0	29.0	4.5
Woodcock	5.7	9.7	6.7	7.3	7.0	3.3

There was a greater variation in the Great Snipe than in the Woodcock.

Great Snipes were often flushed in small groups of 2 - 7 birds. The highest number of flushed Great Snipes on a plot of about 1/4 ha was 9. However, as a rule, birds are scattered in groups of 1 - 3.

The Woodcock more often is flushed solitarily or in groups of 2 - 3 birds.

Habitats of Great Snipes during passage in Karelia are mown clover meadows and tussock meadows of hayfields and pastures, flooded to different extents. The Great Snipe is extremely rare in cabbage-fields and on meadows with high grass. After dry, hot summers Great Snipes prefer low places, in wet summers higher sites.

Main habitats of Woodcocks on passage are deciduous low forests with prevailing grey alder with groves and scattered firs of different age, with windows of glades and hayfields, and also banks of streams, rivers and lakes with similar plantations.

Shevtchenko, V.L, P.V. Debelo, E.I. Gavrilov, V.A. Naglov & A.K. Fedosenko: On the ornithofauna of the region between Volga and Ural Rivers. Fauna and biology of birds of Kazakhstan. Almaty, 1993. Pp. 7 - 103. Pp. 72 - 74.

Jack Snipe (*Lymnocryptes minimus Brunn.*). Migratory species. Several birds 14 and 18 April 1959 were sighted near Furmanovo, and a solitary bird - 27. 04. 1958 - on the estuary (liman) along Kushum river near Shevelev. In autumn solitary Jack Snipes were sighted on 29. 09. and 18. 10. 1957 on lakes near Kozherakhovo, 09. 10. 1958 near Chapaevo, 10. 09. 1957 - in upper parts of Kushum, 19. 09. and 21. 10. 1958 - near Furmanovo.

Snipe (*Gallinago gallinago L.*). Nesting, migratory, passage species. Earlier the species was quite numerous in the lower parts of Ilek River, in the middle part of Ural River and on adjoining lakes (Zarudnyi, 1888). However by the middle of the present century it became rare (Raiskiy, 1955), and for the last years there are no data on nesting.

In Volga-Ural sands (ur. Tuma) passage birds were sighted on 12. 04. 1962 and 27. 04. 1962 and 27. 04. 1963, near Beketai on 07. 04. 1959. Near N. Kazanka it was observed on 07. and 08. 04. 1958, and 1959, 01. 04. 1961, 11. 04. 1985, 08. 04. 1986, near Furmanovo on 08. 04. 1957, 06. 04. 1958, in the mouth of the Kushum river on 17. 03. 1970, in its middle stream on 13. 04.

1958, on Kirov water reservoir on 04. 04. 1970 and 08. 04. 1971, near Ural'sk on 15. 04. 1979.

In the sands there is practically no passage, near N. Kazanka it is most pronounced during the second half of April, when during one excursion 10 - 15 birds were registered, and on 17. 04. 1983 - about 100 birds. In the mouth of the Kushum river in spring 1970 during one day up to 10 snipes where counted, but on 31 March 30 snipes. Approximately the same quantity was on the Lower Uil (ur. Baigundy) 28. 04. 1984.

In the middle Kushum during the second half of April 1958 solitary birds were sighted, but on 26. 04. 1979 along the banks of the Dongulyukskiy water reservoir there were loose concentrations of almost 150 birds. Near Ural'sk on 15. and 22. 04. 1979 57 and 34 birds were counted on a route of 10 km.

Passage is finishing everywhere at the end of April - beginning of May, but on Kushum (Tel´nov, Lobikov) solitary birds were sighted still on 07. and 26. May 1957. 98 sightings provided an average 2 (maximum 23) birds.

Autumn passage starts at the end of July - beginning of August, but on Balykty Lake snipes were sighted on 14. 07. 1959. In lower Ilek from 22. July - 01. 08. 1983 they were common already on small lakes. On 10 km of coast line 40 birds were counted.

In the middle Kushum the first birds were sighted on 17. 08. 1957 and 03. 08. 1958, in Kamysh-Samara system on 27. 07. 1976 and 29. 07. 1977. In August they were sighted everywhere in proper sites. The quantity is migrating in September. At the end of the 1950ies along the Kushum River for example up to 90 - 100 were counted in Ural river floods on small draught lakes up to 10, near N. Kazanka for 1 hour up to 40 birds, some were also near Furmanovo. During last years numbers of Snipe have considerably decreased. On the majority of the water bodies rarely more than 10 birds can be seen during an excursion. For example near Ural'sk on 17. 10. 1980, on Kirov water reservoir on 13. 10. 1976, near Chapaevo and Kozhekharovo on 05. 11. 1957 and 03. 11. 1958, near Furmanovo on 21. 10. 1958, near N. Kazanka on 03. 11. 1957 and 10. 11. 1978, in ur. Tuma on 25. 10. 1962. Near Ural'sk on 27 sites an average of 1,9 (maximum 6 birds) were counted, in the Ural river floods near Chapaevo on 24 sites 2,3 (10), along the Kushum river and near N. Kazanka in 54 sites 4,1 (54) birds.

Weight. Female: September 132,3 g, males: August 87,0 g, September 119,0 g.

Great Snipe (*Gallinago media Lath.*). Passage species. On certain sites it nested in lower Ilek and in the middle Ural southwards to Uralsk (Zarudnyi, 1888, 1897). However already by the 1920ies even in Orenburg it was sighted only as solitary birds, and in subsequent 30 years it was sighted here 3 - 4 times only on passage (Raiskiy, 1955). A solitary female with slightly decreased follicules was shot in middle Kushum near Logashkin on 4 May 1958.

Weight. Female: May 162,0 g.

Woodcock (*Scolopax rusticola L.*). Passage species. Only N. V. Pavlov (1948) mentioned nesting in the middle stream of Ural River.

In spring 6 Woodcocks were sighted on 24 April 1958 in a garden near Aleksandrov-Gai, solitary birds on 21 April 1973 in "dzhingil" groves in Lower Uil near Karabau and on 5 May 1978 on Anis'ino Lake near Uralsk.

Autumn passage is obvious along the Ural river valley, especially in wet years. In surroundings of Yanaikino - Chapaevo from 17 September till 1 November 1956 and from 2. till 13 October 1957 42 and 12 solitary birds were recorded, and in the dry year of 1958 they were sighted only on 27 September and 3 October. Southwards, near Yesenbai, distinct passage was observed during the second half of October 1982 and on 25 September 1983 3 birds were recorded here, and on 16 October 1986 near Yeltai 5 birds. Sometimes Woodcocks are appearing in unusual situations too. So, in October 1956 in fog, 5 Woodcocks were sighted near Karatoba settlement, and several solitary birds on 7 - 9 October 1987 on an airstrip near this settlement.

In Volga-Ural interstream area solitary birds were sighted on 10 October 1976 in willow shrubs on the bank of the Kirov water reservoir, on 2, 7 and 10 October 1958 near ur. Tyurtkul, Ashche-Sai and on liman (estuary) near Furmanovo, on 3 - 24 October 1970 on the Kazbai Lake at the mouth of Kushum river, on 2 - 16 October 1986 on the Pavel-Kul near the mouth of Mukhor River. In sands they were met 28 october 1956, 28 September 1959, 08. 10. 1985 and 07. 10. 1987.

Weight. Female: October 317 g.

Zubakin, V. A. (1988): Birds of the European part of the Soviet Union - candidates for the Red Data Book of the RSFSR. Resources of rare animals of the RSFSR, their conservation and reproduction. M.. Pp. 25 - 32.

Great Snipe (*Gallinago media* Lath.). It was one of the mass game species of the previous century and beginning of our century, bagged by hundreds on the spring leks and on autumn concentrations. As a result of injurious extermination and sharp declining of areas of primordial natural habitats (due to melioration and ploughing up) it became one of the rarest waders of the Centre of the European part of the USSR. Their numbers dropped sharply, even catastrophically in the Baltic States, Baskiria, Volga-Kama Territory. In the Kirov Region bags of 1966 - 1971 dropped to about 1/2 of those of 1959 - 1965. (Pavlov, 1973). Probably the situation of the Great Snipe is somewhat better in more northern Regions. However, rarity of this species on passage (Lebedeva, 1973; Oleinikov et al, 1973; Kostin 1983; Mal´chevskiy, Pukinskiy, 1983) indicates that it may nowhere be numerous in the European part of its breeding range.

The speed of the decline of this earlier numerous species requires immediate measures of conservation. Besides protection of the nesting biotopes and lekking sites, according to our opinion, it is necessary to close hunting on this species in the territory of the European part of the USSR (at least in Karelia, Vologda and Arkhangel´sk Regions and Komi ASSR). It is necessary to include the Great Snipe in the list of especially protected species of the European part of the RSFSR.

HABITATS AND FOODS USED BY WOODCOCKS (*SCOLOPAX RUSTICOLA*) DURING MIGRATION TROUGH NORTH DOBROGEA, ROMANIA, 1970 - 1989

J. B. Kiss, J. Rékási, I. Sterbetz, Zs. Török

Abstract. Habitat use and foods of woodcock (*Scolopax rusticola*) have been determined for 16 years (1970 - 1989) during autumn migration along the Danube Delta (North Dobrogea). 1,361 woodcocks from seven habitat types were observed. Most woodcocks (n = 539, 39.6 %) used *Populus spp.* plantations, other specimens (n = 324, 23.8 %) used mixed plantations of black locust (*Robinia pseudo-acacia*) and ash (*Fraxinus spp.*), among other plant species. For hunting woodcock Hungarian "Vizsla" pointing dogs were used. 208 stomach contents of the shot woodcocks were analyzed. There are no preferred food items. Secondary foods were: *Julus* sp. (17.9 %), *Harpalus* sp. (16.4 %) and *Amara aenea* (11.7 %). Plants are of minor importance (unidentified fragments - 7.1 % - and seeds of *Setaria viridis* - 4.6 % -) in the woodcocks' diet. There were no differences, neither between sexes nor among habitats sampled.

Keywords: *Scolopax rusticola*; woodcock; autumn migration; North-Dobrogea; Romania; diet; habitat.

Introduction

Romania does not have a research programm for woodcock. The present study was made with the authors' personal efforts and with the advices of researchers from foreign groups interested in woodcock (Club National de Becassiers - France; Woodcock and Snipe Research Group - Ireland).

In the present paper the authors study woodcock ecology such as habitats used during staging in autumn and food they ingest during the migrating period.

Methods

215 field trips were made between October and December in the period from 1970 to 1989 (except 1975, 1978 and 1979). The duration of each field trip was at least 2 hours. Hunters walked along transects 40 m apart from each other across the study area assisted by "Vizsla" Hungarian pointing dogs (method described by Imbert, 1988).

208 stomachs were collected from woodcocks shot. In the laboratory sex and age were determined. The specimens were dissected and stomach contents removed and preserved by air drying. Some invertebrates could be identified only as chitin fragments. Sand and gastrolithes were not reported because they do not contribute to the energetic exchange.

To determine food preference the following formula was used:

$$F = (n * 100)/N$$

where F = frequency of a certain food item, N = number of samples (i.e. gizzards and stomachs) and n = number of samples containing any gizzard and stomach food item.

A food item is considered: preferred if F > 50 %,
secondary if F = 10 % - 50%,
accidental if F < 10 %.

Study Area

The research zone extended over the Northern part of the Dobrogea Plateau and the Danube Delta. Part of the study sites (Tulcea, Somova, Murighiol, Sarinasuf) is situated on the plateau, the other part (Letea, Caraorman, Tudor Vladimirescu, Maliuc) is located in the so-called delta.

The climate is temperate, influenced by the Russian Great Plain and moderated by effects of the Black Sea.

Areas in which woodcock were found vary from tens of square meters to several hectares. The studied forest types are:

A. Artificially planted:

A.1. Plantation of *Populus* spp. (age: 36 years, height > 26 m, density 625 trees/ha, altitude < 10 m). Monocultures of *Populus nigra*, understory dominants of *Amorpha fruticosa*, *Salix spp.*, and *Rubus caesius*;

A.2. Mixed Plantations on hills (age: ≥ 40 years) with secondary succession dominated by *Robinia pseudo-acacia*, *Fraxinus ornus*, *Eleagnus angustifolia*, *Maclura aurantiaca*, *Ailanthus altissima* and *Acer tataricum*. Understory is dominated by *Rosa canina*, *Prunus spinosa* and *Sambucus nigra* with grass cover.

A.3. Plantations of *Fraxinus pennsylvanica* (age: > 36 years; height 17 m; density 625 trees/ha) along flooded areas of the Danube River.

A.4. Plantation of *Populus spp.* near the water and with an undeveloped understory without sub-brush.

B. Natural forests:

B.1. Flooded forest (age: mixed, some trees > 100 years; height variable, density variable) dominated by *Salix fragilis* and *S. alba*. Understory lacking because of flooding.

B.2. Natural willow forest (Flooded less often than the previous type) dominated by Salix spp., with understory of *Rubus spp.*

B.3. Other natural habitats:

a). "Hasmac": natural forest as narrow stripes on the sand dunes at < 10 m altitude with *Quercus sessiliflora*, *Fraxinus holotricha*, *F. pallisae*, *Po-*

pulus alba, *P. nigra* and lianas of *Periploca graeca*, *Hedera helix*, *Clematis vitalba*, *Vitis silvestris*.

b). Flooded areas covered by *Phragmites communis*, *Typha spp.*, *Carex spp.* and *Juncus spp.* among different grasses.

c). Forests (age: mixed; altitude < 120 m) with *Tilia cordata*, *Fraxinus spp.* and *Ulmus spp.*, with lots of *Crataegus monogyna*, *Prunus spinosa*, *Cornus sanguinea*, *C. mas* and sparse ground cover of grass.

HABITAT TYPES	Woodcock	
	n	%
Artificial forests		
Plantation of *Populus spp.* with sub-brush	539	39.1
Mixed plantations on hills	324	23.1
Plantation of *Fraxinus spp.* without sub-brush	118	8.7
Plantation of *Populus spp.* without sub-brush, near water	55	4.0
Natural forests		
Flooded forest dominated by *Salix spp.*, lacked sub-brush	111	8.2
Willow forest, sub brush	110	8.2
Other natural habitats (i. e., marshes, "hasmac")	104	7.6

Table 1. Number of woodcocks harvested in different habitat types.

Results and Discussions

Habitat Types Used

In the study period 1.361 woodcocks were observed (90 % were located and collected with "Vizsla" Hungarian pointing dogs, 6 % were seen during crepuscular flights and 4 % were flushed by hunters).

More than 75 % of the the observed birds were in artificial habitats, especially plantations of *Populus spp.* with understory brush, and mixed plantations on hills (table 1).

Habitats of woodcock are variable in size, influenced especially by seasonal flooding, rainfall and grazing by sheep. Woodcock were observed in some areas of a particular biotype, but not in others with similar characteristics of soil (moisture, structure) and vegetation (type, density, height).

Migration phenology

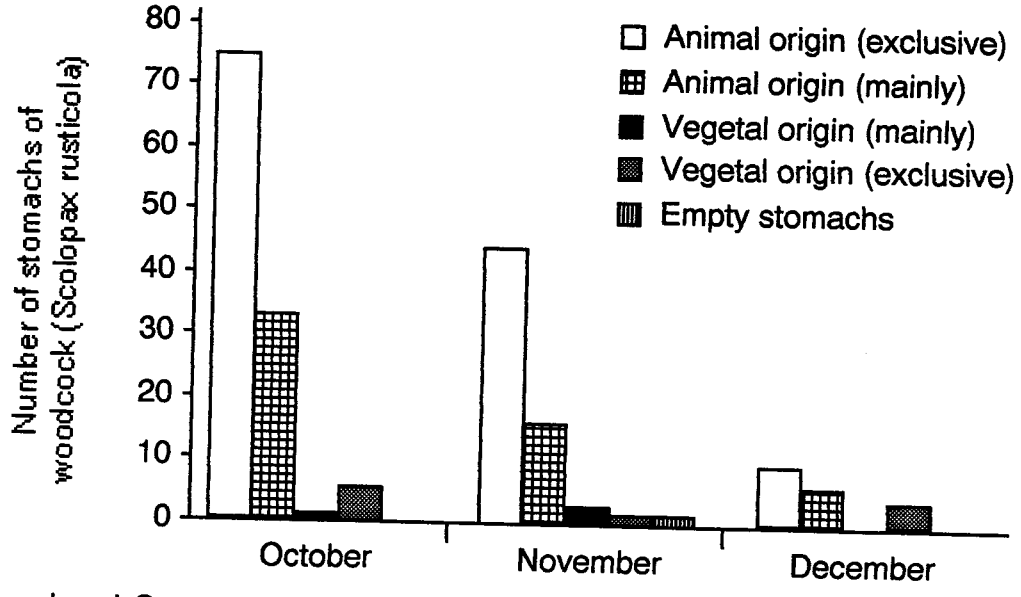
The first woodcocks reach North Dobrogea at the the end of September and their numbers increase after mid-October, with one peak (representing 25 % of the total seasonal number) at the end of October and a second peak at the end of November. The birds were recorded until early December (Kiss, 1976 a, 1976 b, 1977). We have only a few records of woodcock wintering in the study area, because most woodcocks move just South of the area when average temperatures fall below 2° C.

Woodcocks were rarely observed in the studied area during their spring migration (Kiss, 1971). During our research we have not observed woodcocks between May and the end of September, nor nuptial behavior (usually between March and May) nor nesting woodcocks in the Danube Delta. There are earlier observations on presence (Almásy, 1898) and on nesting of woodcocks in Northern Dobrogea (Floericke, 1918; Ionescu 1968; Pascovschi, 1973).

Feeding Areas

During their migration through North Dobrogea woodcock feed during the day in diurnal coverts used as shelters (Kiss and Rékási, 1980; Kiss et al., 1988, 1989). The birds fly daily (in the evening) to the feeding places and return (in the early morning) to their resting areas. This phenomen was often described by several authors (Chernel, 1899; Ferrand and Gossmann, 1988; Glutz, 1977; Granval, 1988 a; Szabolcs, 1971).

Fig. 1. Animals and plant items in the diet of 208 woodcocks collected in North Dobrogea (Romania), 1970-1989.



Ferrand and Gossmann (1988) and Granval (1988) observed woodcock using pastures and agricultural fields in France. None of the woodcocks observed in North Dobrogea used agricultural lands as feeding areas, although inverte-

brate densities may be greater there. Only earthworms reach a biomass 12 times greater in the agricultural lands than in the forest areas (Granval, 1988 a).

Imbert (1988) has reported that females in Bretagne, France, prefer lower and wetter areas.

Diets of Woodcock

Woodcocks examined were collected in the following areas: Tulcea (n = 173), Letea (n - 14), Caraorman (n = 7), Somova (n = 5), Murighiol (n = 3), Tudor Vladimirescu (n = 3), Maliuc (n = 2), Sarinasuf (n = 1). 208 stomachs were collected from woodcock we shot (October n = 116; November n = 72; and December n = 20).

33 plant items and 83 animal items from stomachs of 208 woodcock shot were identified. The species exceeding 1 % in frequency of occurrence are shown in figure 1 and table 2.

There are no differences between the contents of stomachs collected in different months.

None of the food items were preferred. Secondary food items were *Julus sp.* (16.8 %) and *Harpalus sp* (15.3 %).

Of 83 invertebrate species at least 20 were aquatic (*Naucoris sp.*, *Hydrophilidae sp.*, *Libellula sp.*, grubs and *Dytiscus sp.*, *Elaphrus sp.*, *Clivina sp.*). Their presence in stomachs explains the woodcock's twilight flights from puddles, swamps, and canals of the Delta forests to other habitats (for example plantations, pastures, swamps).

The importance of earthworms (Bouché, Fayolle and Richard, 1984; Veiga, 1988) and other soft-bodied invertebrates may have been underestimated because of the difficulty in preserving components that are digested quickly (Devort, 1988; Granval 1988 b).

Granval (1988 b) found that females eat numerous earthworms and grubs, but we observed no sex-related differences in diet.

Of 33 plant species 9 were aquatic. Plants have minor importance in the woodcock's diet. Considering the 5 Kcal/g (dry weight) required for woodcock (Devort 1988), seeds probably are not an important energy source. Plant fibers may contribute to better mastication of diets, as noted for common snipe (Devort 1988).

The other taxa (56 aquatic or upland invertebrate species and 28 plant species) were ingested only one or two times.

Adequacy of Diet

Woodcock and common snipe are similar systematically and in food requirements (Devort, 1988). Body mass of common snipe (*Gallinago gallinago*) is about 100 g (Devort, 1988) and that of woodcock is 328.5 g (standard error = 3.0) for males and 326.9 g (standard error = 2.8) for females in autumn (Kohl and Kiss, 1989).

Food components	October		November		December		Total		
	F.	No.	F.	No.	F.	No.	F.	%	No.
Carex sp.	2	4	2	8	0	0	4	2.0	12
Chara sp.	1	x	1	x	2	x	4	2.0	12
Chara "oogonia"	1	28+x	1	10	0	0	2	1.5	38+x
Echinochloa crus galli	3	5	0	0	0	0	3	1.5	5
Polygonum aviculare	4	5	1	6	1	5	6	3.0	16
Robinia pseudo-acacia	4	5	1	6	1	5	6	3.0	7
Setaria viridis	2	x	5	x	2	2+x	9	4.6	4+x
Unident. roots	2	x	1	x	1	x	5	2.5	x
Unident. seeds	1	2	1	1	0	0	3	1.5	5
Unident. plant fragments	13	x	0	0	1	x	14	7.1	x
Amara aenea	10	19	8	15	2	5	20	10.2	39
Berosus sp.	2	3	1	1	0	0	3	1.5	4
Carabidae (spp.)	2	2	1	1	7	x+4	10	5.1	7+x
Carabus sp.	9	11	4	6	1	1	14	7.1	18
Coleoptera sp.	2	2	2	2+x	1	1	14	7.1	18
Corixa punctata	1	2	2	3	1	1	4	2.0	6
Diplopoda (sp.)	15	30	3	31	0	0	18	9.2	61
Elaphrus riparius	2	2	2	2	0	0	4	2.0	8
Forficula auricularia	1	1	2	1+x	1	1	4	2.0	3+x
Geotrupes sp.	7	11	3	4	0	0	10	5.1	15
Glomeris hexasticha	16	12	10	49	2	6	18	5.1	15
Glomeris sp.	2	18	1	11	1	1	3	1.5	29
Harpalus affinis	12	17	2	4	1	1	13	6.6	22
Harpalus sp.	22	73	10	31	0	0	32	16.4	103
Hydrophilidae sp.	5	1+x	0	0	0	0	5	2.5	1+x
Laccobius sp.	2	9	1	6	0	0	3	1.5	15
Lithobius sp.	4	7	1	1	0	0	5	2.5	8
Naucoris cimicoides	6	12	1	5	0	0	7	3.5	17
Sigara lateralis	1	6	2	2	0	0	3	1.5	8
Sigara striata	3	4	0	0	0	0	3	1.5	4
Trechus quadristriatus	5	0	0	0	0	0	3	1.5	3
Zabrus tenebroides	7	9+x	5	11+x	2	2	14	7.1	25+x
Unident. chitin fragments	12	x	0	x	0	0	23	11.7	x
Unidentified pupa	5	x	6	x	1	1	12	6.1	x
Julus sp.	12	21	20	53	3	6	35	17.9	80
Mollusca spp. (unindent.)	5	x	5	x	1	x	11	5.6	x
Lubricidae sp.	1	1	2	x	0	0	3	1.5	1+x

Table 2. Food items in stomachs of woodcock (F = relative frequency).

Woodcock has a large body size and a relatively reduced mobility and energy loss. Taking into account these facts, we consider that woodcock has an energetic requirement three times greater than that of common snipe and the metabolism is 25 % less for woodcock compared with common snipe. In our opinion a migratory woodcock needs 190 g insects or about 250 g earthworms daily (or some combination of each). Thus, woodcock may consume a daily quantity of food almost equal to its body weight, as reported from other shorebird species (Devort, 1988).

Conclusions

Northern Dobrogea (Romania), especially the Danube Delta, represents an important staging area for woodcocks during the autumn migration. None of the specimens is wintering in this area. During spring migration only few woodcock cross North Dobrogea.

Forest plantations represent important habitats during autumn migration. More than 75 % of the woodcock were observed in artificial forest plantations. The numbers of migrating woodcock reach two peaks: one at the end of October and a second one at the end of November.

The diet of Delta woodcock is variable, including plants and animals (many of them aquatic organisms). There are no prefered food items. Some of the arthropodes (*Julus sp.*, *Harpalus sp.*, *Amara aenea*) are secondary food. We have observed no difference in feeding behavior between males and females nor in areas preferred by them, nor were there seasonal variations. Vegetal components are accidentally ingested (i. e. unidentified plant fragments 7.1 %; *Setaria viridis* 4.6 %).

Therefore, the woodcock seems to be a typical generalist.

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Ferrand, Y. & F. Gossmann (1995): La Becasse des bois. Hatier, Paris. 164 pp.

The two most active French colleagues have summarized their knowledge on their study subject and produced a wonderful monography on the woodcock (*Scolopax rusticola*). Breeding biology, migration, wintering, population dynamics and aspects of woodcock hunting are described in an easily understandable style, based on the most recent results of woodcock research. The text is illustrated not only by impressive color photos but also by many explanatory drawings, graphs and maps.

For anybody interested in the life history of this secretively living species this book is an excellent guide. It fits perfectly into the series of precious woodcock monographies edited in France, Britain and North America during recent years.

H.K.

Fiske, P. & J. A. Kålås (1995): Mate sampling and copulation behaviour of great snipe females. Anim. Behav., 49: 209 - 219.

Mate sampling by great snipe, *Gallinago media*, was studied by following individually marked females on their visits to two leks in five consecutive mating seasons. The main objectives were to determine whether the females used a sequential search or a best-of-N-males comparison when selecting a mating partner, and to evaluate the consequences of females engaging in copulations with more than one male and in repeated copulations with the same male. The minimum length of the period between the first observation of a female and her first observed copulation varied from 0 to 18 days (median 4). One to 10 males (median = 2) were visited in the pre-mating period. Nineteen females (58 %) mated on their first observed visit to the territory of a male, whereas 14 (42 %) returned to a previously visited male to mate. Seven (21 %) of the females were seen copulating on more than one night, and four of them changed copulation partner between nights. The fact that so many females were seen returning to a previously visited male to mate is best explained by a best-of-N-males comparison, but the results could also be explained by a sequential search strategy with a variable threshold. Females copulated more with successful males and they copulated more when other females were present on the territory of the male than when alone. Competition between females ist most likely to account for these differences, but the mechanism is not known. The testes of great snipe males were large compared with those of other waders, indicating that sperm competition is important in this lekking species.

Fiske, P., J. A. Kålås & S. A. Sæther (1994): Correlates of male mating succes in the lekking great snipe (*Gallinago media*):results from a four-year study. Behav. Ecol. 5: 210 - 218.

To investigate behavioral or morphological traits important as mate choice cues, selection differentials (s) as the covariances between each trait and male mating success, and directional selection gradients (ß) from multiple linear regression of the standardized traits on male mating success were measured.Data from two leks in four consecutive years were included, and the annual data were analyzed separately. The main findings are: (1) the distribution of male mating success proved to be less skewed than those found in many other lekking species, (2) only a few traits yielded significant selection

gradients, (3) the importance of age on male mating success changed across years, (4) females may use traits with a high variance as mate choice cues, and (5) individual males achieved similar mating successes between years. Attendance and age were the traits most consistently correlated with male mating success, but no traits showed significant selection gradients in all years. Our results indicate that variable sexual selection pressures existed between years, but the high correlation found between the mating success of individual males in successive seasons also indicates that permanent differences in male traits are important.

Fujimaki, Y. (1994): Distribution and abundance of the Latham's Snipe in south-eastern Hokkaido, Japan. Strix (Journal of Field Ornithology) Vol. 13: 73 - 78. (Japanese, English summary).

Latham's Snipes *Gallinago hardwickii* were counted along 2-km line transects in 192 5 x 5 km quadrats in the Tokachi and Kushiro districts, Hokkaido, from late April to late June, 1978 - 1994. Based on the line transect census data and the records previously obtained, Latham's Snipes occurred mainly in riverine and agricultural areas below 500 m above sea level. Of 192 quadrats censused, Latham's Snipes were recorded in all the riverine quadrats, 81 % of agricultural lands, 72 % of agricultural land with isolated woods, 55 % of young plantations and forest clearings, but not in mature forests and residential areas. The number of birds (mean ± SD) counted per 2-km transect were 4.8 ± 2.9 in riverine habitats, 1.8 ± 1.4 in agricultural land, 1.2 ± 1.0 in agricultural land with isolated woods, and 0.6 ± 0.5 in young plantation and forest clearings. These results indicate that riverine and adjacent areas are primary habitats for Latham's Snipes.

Since Latham's Snipes are fairly commonly found in agricultural lands, there is a prospect that their secondary breeding habitat will remain in large areas in Hokkaido.

Kålås, J. A., L. Løfaldli & P. Fiske (1989): Effects of radio packages on Great Snipe during breeding. J. Wildl. Manage. 53(4): 1155 - 1158.

Short-term effects of glue-mounted radio packages in breeding great snipe (*Gallinago media*) in central Norway were studied. No significant differences between radio-tagged and untagged females were found for clutch size, clutch volume, egg-fertilization, physical condition during incubation, or return rate the following season. Observations of lekking males 48 hours after packages were attached to them did not indicate changes in territorial behavior.

Kålås, J. A., P. Fiske & S. A. Sæther (1995): The effect of mating probability on risk taking: an experimental study in lekking Great Snipe. The American Naturalist. Vol. 146, No. 1: 59 - 71.

The relationship between mating probability and risk taking for lekking animals disturbed by predators was modelled. Our dynamic model is based on different mating probability with hiding time after a predator attack at the lek. The model predicts that a lekking male with low expected mating probability should hide for a longer period after a predator attack than a male with high mating probability. It also predicts that males should hide for a longer period when predation risk is high and that a high mating advantage of a rapid return after an attack reduces the differences in optimal hiding time among males with different mating probabilities. To test the first prediction from the model,

we have flushed great snipe(*Gallinago media*) males from leks and compared their hiding times to their temporary expected mating probabilities. As predicted by our model, males with the highest expected probabilities of mating had the shortest hiding times.Empirical data also showed that individuals adjusted their hiding time to temporary changes in their probability of mating. Such plasticity in mating behaviour may reduce differences among males in lifetime reproductive success and thus also reduce the intensity of sexual selection.

Kålås, J. A., S. Bretten, I. Byrkjedal & O. Njåstad (1994): Radiocesium (^{137} CS) from the chernobyl reactor in Eurasian woodcock and earthworms in Norway. J. Wildl. Manage. 58 (1): 141 - 147.

To understand the ecological effects of the Chernobyl reactor accident, radiocesium (^{137} CS) levels in Eurasian woodcock (*Scolopax rusticola*), earthworms (Lumbricidae), litter (dead organic materials lying on the ground), humus (beneath litter 2 cm deep), and mineral soil samples (3 - 6 cm deep) from a heavily effected (20 - 60 kBq/m^2 [1 Bq = 1 nuclear fission/sec]) area in Norway were investigated. The highest concentrations measured in earthworms (1988 median = 142 Bq/kg) and woodcock (1986 median = 730 Bq/kg) were below levels that should affect animal health. Values above the European Economic Community's limit for human food (600 Bq/kg fresh mass) only were found in woodcock during 1986. Radiocesium concentrations decreased ($P < 0,001$= in earthworms (40 %) and woodcock (94 %) from 1986 to 1990. There was no reduction in total radiocesium in soil over the same period. The relatively high radiocesium concentrations in woodcock during 1986 and the decreasing radiocesium ratio in woodcock to earthworms during the first years following fallout could have been caused by woodcock ingesting abiotic radiocesium with earthworms. The decrease in radiocesium in woodcock and earthworms during the study (1986 - 90) probably resulted from decreasing bioavailability of radiocesium during the first years after fallout rather than by radiocesium disappearing from the ecosystem.

Keppie, D. M. & R. M. Whiting, Jr. (1994): American Woodcock (*Scolopax minor*). The Birds of North America, No. 100, 28 pp. A publication of The American Ornithologists' Union, edited by A. Poole & F. Gill.

A complete life history of the New World sister of *Scolopax rusticola*. On 28 pages recent knowledge of almost all aspects of this popular species is summarized, referring to an extensive list of scientific literature. Especially during the last 20 years research efforts have increased considerably, with modern methodology including extensive ringing programmes, radiotelemetry and removal experiments. These efforts were obviously a consequence of the increasing interest of recreation hunters in this game species. More than 2 million woodcocks are bagged annually by about 700.000 hunters. Recovery rates below 5 % suggest that the long-term decline in the eastern part of the range may have other causes than overharvest. Use of pesticides and especially changing habitat quality in areas of high human population density is supposed to have most detrimental effects.

H.K.

Løfaldli, L., J. A. Kålås & P. Fiske (1992): Habitat selection and diet of Great Snipe *Gallinago media* during breeding. Ibis 134: 35 - 43.

The Great Snipe (*Gallinago media*) is considered to be an endangered species. This paper examines its food and habitat use on a sub-alpine/low-alpine breeding area in central Norway. It was estimated that earthworms constitute

more than 90 % of Great Snipe food (by weight). Feeding birds selected the low herb willow scrub vegetation community and to a lesser degree eutrophic fen. Birds did not selectively feed on eutrophic dwarf birch/juniper heath despite it being the third most used vegetation community by virtue of its extent. Although soil penetrability, vegetation cover and earthworm density varied across vegetation communities, Great Snipe selected sites with similar habitat characteristics in different vegetation communities. Great Snipe seemed to select for an optimal combination of soil penetrability and earthworm density, and for medium scrub cover. Nests were found in a broad range of vegetation communities, but only low herb willow scrub was selectively used. However, an equal number of nests was found in eutrophic fen due to its larger extent. Dense vegetation cover around nests and short flushing distance of incubating females indicate low sensitivity to disturbance. We consider the Great Snipe to be a food and habitat specialist, requiring habitats rich in sub-surface invertebrates to breed. This may explain its scattered distribution in Scandinavia, and may render it vulnerable to habitat modification and loss.

Sæther,S. A. (1994): Vocalizations of female Great Snipe (*Gallinago media*) at the lek. Ornis Fennica 71: 11 - 16.

The occurrence of loud vocalizations by female Great Snipe (*Gallinago media*) is reported for the first time. Such female loud calls were easily distinguished in the field from the male vocalizations. The female behaviour associated with the vocalizations resembled male display postures. Sonagrams show a structural resemblance with part of the male display call. The female loud call consisted of short notes with a large frequency spectrum repeated 18 - 27 times in 1 to 1.5 seconds. In 1992 a total of 96 female loud calls were heard at three leks in central Norway, including 63 at a single lek. Loud calls were heard from 22 May to 7 June, and the median date was 25 May. Loud calls occurred throughout the night from 23.20 to 02.51 h, with a peak around 02.00 h (summertime). Loud female vocalization seems to be a regularly occurring behaviour pattern for Great Snipe. Other female vocalizations heard on Great Snipe leks included flight calls, "walk calls" and faint postcopulatory calls.

Sæther, S. A., J. A. Kålås & P. Fiske (1994): Age determination of breeding shorebirds: quantification of feather wear in the lekking Great Snipe. The Condor 96: 959 - 972.

We develop a method of aging Great Snipe (*Gallinago media*) by quantifying primary feather wear. No reliable method has hitherto existed to separate young (first-summer, second calendar year) and old Great Snipe during the breeding season. We quantified primary wear of cut-off feather tips using a binocular microscope and scored the degree of wear on six variables. We found that primary wear separated well between young and old birds, whereas morphological variation did not. In a sample of 405 Great Snipes from Norway, 98.7 % of the males of known age (74 old, 3 young) were correctly classified to age with discriminant analysis using primary feather wear. We review the potential use of primary feather wear to separate first-summer individuals from older individuals in 113 Nearctic and Palearctic shorebird (*Charadriiformes*) species. We note that in the majority of species, differential primary wear is the only available aging method during the breeding season.