INTERNATIONAL WATERFOWL RESEARCH BUREAU

WOODCOCK & SNIPE RESEARCH GROUP

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International Waterfowl Research Bureau

WOODCOCK AND SNIPE RESEARCH GROUP

Newsletter No. 12 December 1986

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EDITORIAL

By this Newsletter number twelve of the Woodcock and Snipe Research Group we want to inform about recent publications, preliminary results of research going on as well as short notes that might be of interest.

Meetings

During the 33rd General Assembly of the Conceil International de la Chasse (C.I.C.), May 7 to 11 at Paris the Coordinator reported on the results of the International Woodcock Research Project (below). He expressed thanks to the Working Group on Migratory Birds within the CIC Migratory Bird Commission and especially to Mr. Pouget who had organized the financing of the six month project in 1985.

At the 32nd Board Meeting of the International Waterfowl Research Bureau (IWRB), September 22 to 26, at IWRB-headquarters at Slimbridge the Coordinator reported on the group's activities as well as outlines of future research.

Thanks to an invitation of the French Office National de la Chasse members actively involved in research could convene for the Third European Woodcock and Snipe Workshop at Paris, October 14 to 16. More details on this matter are summarized in this issue (p. 20 to 36).

Research

After financial problems were settled the Joint Coordinator could go on with his studies and supervise the fieldwork conducted within the International Woodcock Project. An outline of the activities of 1986 are given in this issue (p. 9 to 12), and first results were presented during the Third Workshop by G. Hirons and V. Bouckaert, who works at the French study area (Forest Compiegne). Due to lack of manpower during the breeding season we could not yet start working at the third study area (Higher

Black Forest, FRG) as was scheduled for May 1986; these activities are in the program for 1987.
We are very grateful to IWRB and to CIC-delegations of six European countries for financing this project. Almost half of the costs are taken over by France, thanks to the generosity of Mr. Lefeuvre, president of the Club des Becassiers and hopefully again by Mr. Pouget's Working Group on Migratory Birds, as promised. By this France pays regard to the fact that woodcock hunting is more popular here than in any other country of Western Europe.
Fund raising is of greatest importance for the future of such a project. So we are very grateful to Mr. v. Hasselt (Holland) to take care of this financial part. Administration, budgeting etc. is done by the University of Oxford.

Publications

Proceedings of the Second Woodcock and Snipe Workshop are still available and can be ordered directly by H. Kalchreuter.
Other publications concerning woodcock and snipes are reviewed in the Bibliography of this issue.

Dr. Herby Kalchreuter (H.K.)
Coordinator
7823 Bonndorf-Glashütte
F.R.G.

Dr. Graham Hirons (G.H.)
Joint Coordinator
Dept.of Zoology
Edward Grey Institute
South Parks Road
Oxford OX1 3PS
U.K.

NATIONAL NOTES

AUSTRIA

On the phenology of Woodcock migration in Eastern Austria 1985

Philipp Meran

Spring migration: Due to considerable snowfall at March 19 and 20, most of the favourable woodcock habitats in Eastern Austria were covered with up to 80 cm of snow. So hardly any woodcocks were seen in these areas, but many in Hungary in the Lake Balaton and Budapest areas, free of snow. Snow cover has obviously caused a change in geographical migration patterns. When April finally brought higher temperatures most of the spring migration was over.
The following table lists woodcock shot when roding in spring 1985.

Date	Location	Weight (gr.)	Sex	Age	Bill length (cm)
16.3.	Strem, Altwald	305	♂	ad.	7.5
27.3.	Siegendorf	306	♂	ad.	7.8
28.3.	Siegendorf	285	♀	juv.	7.3
30.3.	Siegendorf	340	♂	ad.	6.9
3.4.	Strem, 22-er	310	♂	juv.	7.3
7.4.	Strem, Bodens.	325	♂	juv.	7.1

The only female was shot from a pair and thus might document a rare example of a real pairflight. While by far most flights involving two or more birds are pursuit flights of males chasing each other. The weight of this

juv. ♀ was remarkably low, indicating it was not yet involved in the reproductive cycle.

Fall migration: Exceptionally many woodcock came through Eastern Austria in fall 1985. Peaks of influx were recorded at October 12 and 26 and a last one at November 8. Snow cover at November 11 terminated fall migration in this region.
During drive hunts on small game high numbers of woodcock were flushed (in one case 40, of which 12 were bagged). The following table lists 11 woodcock bagged of 58 seen during evening flights, fall 1985:

Date	Location	Weight (gr.)	Sex	Bill length (cm)
8.10.	Rosenkogel	295	♂	6.9
10.10.	Kremser,Stahel	330	♂	7.4
10.10.	Kremser,Stahel	340	♀	7.3
17.10.	Kremser,Stahel	315	♀	7.3
28.10.	Gasselsdorf	322	♂	6.9
29.10.	Gasselsdorf	312	♂	7.8
29.10.	Gasselsdorf	350	♀	8.0
29.10.	Gasselsdorf	330	♂	7.1
7.11.	Gasselsdorf	335	♀	7.2
8.11.	Rosenkogel,Mendel	350	♂	6.9
10.11.	Gleichenberg	325	♂	7.2

The two birds bagged on October 10 were flying together.

Author's adress:

Steierisches Jagdmuseum
Graz, Austria

BRITAIN and IRELAND

Beating nature's camouflage: locating woodcock on the ground in woodland by the use of a thermal imager

Graham Hirons and Mark Lindsley

Population studies of woodcock have always been hampered by the difficulty of finding nests. "Cold-searching" is inefficient and success declines sharply with increasing ground-cover. Searching with dogs can cause disturbance and success rates will vary according to the individual dogs used, weather, cover-type, time of day etc. Furthermore, females are difficult to capture for radio attachment, and once marked prove to be far more mobile than males during the breeding season. One potential way of "unmasking" well-camouflaged incubating woodcock is to scan the woodland floor with a thermal imager. This provides a thermal picture in which, at low ambient temperatures, "hot" objects, such as an incubating woodcock, will stand out against their cooler surroundings.

This note reports our initial attempts to find woodcock nests with a thermal imager at Whitwell Wood, a 126 ha mainly deciduous woodland in Derbyshire England in April 1986.

Methods

Our initial trials, conducted on a cool day (max. temp. 8°C), indicated that through the thermal imager radio-tagged woodcock could be detected on the ground within woodland at ranges up to 30 m. Accordingly, we systematically searched areas for woodcock by walking along

transects about 20 m apart, stopping every 20 paces to scan the ground up to 20 m ahead through an arc of 180°.

Trials were conducted during the period 20-28 April under a variety of weather conditions, and at night. Observations were confined to areas of the wood favoured by nesting woodcock in previous years. These were mainly stands of sycamore (Acer pseudoplatanus) with a light ground cover of brambles (Rubus spp.) and newly-emerging dog's mercury (Mercurialis perennis).

Results

Systematic searches were made with the thermal imager for a total of almost 40 hours. In this time only 6 woodcock were detected ie. one every 6 1/2 hours. None of them was an incubating female. As expected detection rates varied with ambient temperature which in turn was influenced by time of day and weather (Table 1). No woodcock or other ground-living animals were detected under warm, sunny conditions, but at night woodcock were found every 4.4 hours and other animals (pheasants, rabbits or hares) every 1.25 hours. For both groups detection rates were intermediate during overcast conditions in daytime (Table 1).

Light Conditions	No. Hours Observation	Woodcock (No.)	Detection Rate (hours/woodcock)	Other Species* (No. individuals)
Daylight/Overcast	25.5	4	6.3	4
Daylight/Sunny	5.5	0	-	0
Night	8.75	2	4.4	7
Total	39.75	6	6.6	11

*pheasants, rabbits and hares.

Table 1: Detection of woodcock in Whitwell Wood, Derbyshire 20th-28th April 1986 by means of a thermal imager.

Discussion

In most years the peak period for the initiation of woodcock nests found in Whitwell has been 1-10 April. However in 1986, April was cooler than average and five of the nine nests found were started after 28 April, the date when observations with the thermal imager ceased. This suggests that there my have been very few nests available to be found during the time the thermal imager was used, especially as the peak density of active nests may be as low as one nest per 15 ha even in the favoured part of the wood (unpublished data).

Although detection rates for woodcock under overcast conditions in daylight and at night were apparently similar, the number of birds available to be detected would have been much higher during the day. A concurrent radio-tracking study suggested that 94% of woodcock spending the day in Whitwell at this time left the wood for the night. Thus, the real detection rate may have as much as 25 times higher at night than during the day.

Conclusions

Thermal Imagers are expensive to hire (ca. £325 per week) and the overall detection rate in the above trials was disappointingly low. Nevertheless, we believe that if small areas of woodland were to be searched systematically with a thermal imager at night, a high proportion of the nests present would be found. This would provide better estimates of nest densities than hitherto, and would perhaps also allow calibration of other nest-finding methods.

Acknowledgements

This work forms part of a wider study funded by I.W.R.B. and the Dutch, Finnish, French, German and Swedish delegations of C.I.C. To all these organisations we are most grateful.

Author's adress:

Edward Grey Institute,
Dept. of Zoology,
South Parks Rd.
Oxford OX1 3PS.

International Woodcock Project - Activities 1986

Graham Hirons

Fieldwork has been carried out in Whitwell Wood, Derbyshire during April and May 1985 and from March to July 1986. In the next two years comparative studies of breeding success and habitat preferences will be undertaken in Upper Black Forest and Forest of Compiègne. During the initial two years of research in Whitwell, 43 birds were marked, including 34 with radio-tags. In addition 24 chicks were ringed from eight broods. Of the 33 birds trapped in 1986, two had previously been ringed as chicks in 1985 and 2 as adults in 1985. The recovery and recapture/retrap data from these two years when combined with that from the years 1978-81 will provide the most precise estimates for annual survival, and mortality rates due to shooting, yet available for any woodcock population. This analysis will be given top priority in the coming months.

Habitat research

In April and May 1985, vegetation studies and composition, and soil parameters were recorded for quadrats containing the feeding locations of radio-tagged birds, nests and random locations. Significantly different mean values between feeding and random sites were found for 11 variables. Feeding sites were in younger stands with a higher percentage ground cover of Mercurialis perennis and consistently higher values for pH. Earthworm biomass here was on average 82% greater than in random plots. Areas of beech were avoided. A discriminant function based on six habitat variables correctly classified 85.5% of the feeding sites. The important factors determing where feeding occurs are probably safety from avian predators and high availability of earthworms.
Discriminant analysis of the habitats used for feeding by solitary birds, broods, and for resting produced significant

functions which correctly classified 84% of sites. Nests were in areas with a high percentage cover of brambles and more open ground vegetation. Broods and solitary birds used similar areas characterised by denser ground vegetation than nest sites. The reuslts of this study indicate that both habitat structure and food availability influence the distribution of woodcock in the breeding season. 45 nests have now been found in Whitwell. 78% of these have been in stands of sycamore (covering 55.4% of the area) and only 14.3% in stands of beech (covering 36.6% of the area).

Behaviour Patterns

In 1986 nocturnal locations of woodcock without nests or broods were determined on 195 bird/nights during the period mid-March to mid-July. The proportion of nights spent outside woodland increased from zero in March (i.e. all birds leaving wood at night) to 91% in July. The proportion of nights spent on pasture fields decreased steadily from 100% in March to 39% in May. The average distance flown by birds to pasture fields from their diural locations was 1.25 km.

Roding Counts

The number of roding observations per evening were monitored in 3 discrete areas of the wood. The sites were more than 1 km apart. During the peak of the roding season the mean number of observations per evening at the 3 sites were 27.3 (range 7-48), 11.6 (4-22) and 8.25 (4-10). The number of radio-tagged birds recorded roding at these sites were 7, 6 and 2 respectively. Four of the individuals recorded at the best site were also observed to rode over the next best. At the major site one marked bird was recorded 21 times on one evening! This example illustrates the problems of estimating total numbers of birds from counts of roding birds. However, there is probably a relationship between the number of roding birds coun-

ted and the availability of females based on the distribution of nests. The wood was subdivided into 3 approxinately equal areas with a roding observation point at the centre of each. Since research began at Whitwell 76% of the nests found have been in the area containing the observation point where most roding ocurred in 1986 (mean 27.3 roding observations per evening), 15.5% in the next best (mean 11.6 observations per evening) and only 89% in the worst of the 3 sites monitored (mean 8.25 observations/evening).

Roding Behaviour

Much of this information has yet to be analysed. In 1986 44% of the 16 males radio.tagged were in their first year (young/adult ratio 0.78:1), but only 3 of 7 first year birds roded and these only late in the season. First-year males also moved between woods frequenty with the result that on average they were located on half as many days as adult males.

Nesting

8 nests were found in 1985 and 9 in 1986. Based on the daily probability of nest survival, the estimated nesting success (i.e. proportion of nests surving to hatching) was 72.1% in 1985 and 39.6% in 1986. The overall estimated nesting success for the years 1978-81 and 1985/86 is 41.0%. There are no comparable data for other areas.

Nest-finding

In 1986, a thermal imager was used for one week in April as an aid to find incubating female woodcock, but with little success. In 40 hours of use, no incubating woodcock were located and only six resting birds. During overcast conditions by day a woodcock was located every 6.3 hours, at night one woodcock every 4.4 hours. No birds were located during sunny conditions. Bearing in mind that almost all woodcock without nests leave

the wood at night in April, the efficiency of finding woodcock was clearly much higher after dark. Thus, it may be worth persevering with this method in future years, with all searches carried out at night. Searching limited areas thoroughly may yield the first precise estimates of nest density.

Dr. Graham Hirons

HUNGARY

Some notes on the woodcock (Scolopax rusticola) bags in Hungary, 1983 (summarized from a manuscript in German by H.K.)

Sandor Faragó

As noted in a prior paper (WSRG Newsletter 1985: 33-39) the woodcock bags of 1983 were the highest since many years. Table 1 gives the figures from the 19 Hungarian counties and the relevant data of 1982. An overall increase of 307 more woodcock bagged in 1983 was mainly caused by an increase in the northern counties (between 6 and 112), while bags slightly decreased in the southern parts (2-19), as is obvious from figure 1.

There are 792 hunting districts in Hungary. In 184 of them (23.2%) woodcocks were shot, but the bags are unevenly distributed (Table 2). While from hardly any hunting district of county No. 3, 5, 15 and 16 woodcock bags were reported, there were other counties (No. 11, 13 or 17), where in half of the districts woodcocks were shot. The size of the bag yielded within the hunting districts, summarized in five categories, is given in table 2. In most of the districts between 1 and 10 woodcocks are bagged, and in only one more than 100. This distribution is graphically demonstrated by figure 2 ($r = 0,9851$).

No	County	Woodcocks bagged	Bag/1000 ha woodland	Difference 1982/83
1	Baranya	118	1,12	- 13
2	Bács-Kiskún	30	0,26	- 11
3	Békés	11	0,49	+ 6
4	Borsod-A.-Z.	225	1,23	+ 15
5	Csongrád	0	0,00	- 2
6	Fejér	93	1,78	+ 59
7	Györ-Sopron	82	1,17	+ 21
8	Hajdú-Bihar	82	1,36	+ 43
9	Heves	136	1,52	- 20
10	Komárom	70	1,31	+ 25
11	Nógrád	194	2,47	+ 14
12	Pest	262	1,63	- 3
13	Somogy	275	1,74	+112
14	Szabolcs-Sz.	79	1,22	- 9
15	Szolnok	3	0,11	+ 1
16	Tolna	0	0,00	- 19
17	Vas	206	2,31	+ 79
18	Veszprém	118	0,86	+ 26
19	Zala	56	0,54	- 17
H U N G A R Y		2.040	1,23	+307

Table 1: Woodcock bags in Hungarian counties, 1983.

No	County	Hunting-districts per county	Huntingdis-tricts with woodcock bags	%	Number of woodcock shot per hunting district					
					1-10	11-20	21-30	31-40	41-100	>100
1	Baranya	34	14	41.2	11	2	1	-	-	-
2	Bács-Kiskún	43	5	11.6	5	-	-	-	-	-
3	Békés	54	1	1.9	-	1	-	-	-	-
4	Borsod-A.-Z.	70	20	28.6	9	10	1	-	-	-
5	Csongrád	26	0	0.0	-	-	-	-	-	-
6	Fejér	45	11	24.4	7	3	1	-	-	-
7	Györ-Sopron	35	7	20.0	3	4	-	-	-	-
8	Hajdú-Bihar	39	4	10.3	2	-	-	1	1	-
9	Heves	38	9	23.7	2	6	1	-	-	-
10	Komárom	28	9	32.1	7	2	-	-	-	-
11	Nógrád	30	14	46.7	6	6	1	1	-	-
12	Pest	91	22	24..	18	2	-	-	1	1
13	Somogy	43	24	55,8	13	5	6	-	-	-
14	Szabolcs-Sz.	45	7	15.6	3	4	-	-	-	-
15	Szolnok	38	2	5.3	2	-	-	-	-	-
16	Tolna	39	0	0.0	-	-	-	-	-	-
17	Vas	27	15	55.6	6	7	1	1	-	-
18	Veszprém	39	14	35.9	11	2	1	-	-	-
19	Zala	28	6	21.4	4	2	-	-	-	-
HUNGARY		792	184	23.2	109	56	13	3	2	1

Table 2. Woodcock bags yielded in 1983 in Hungarian counties and hunting districts

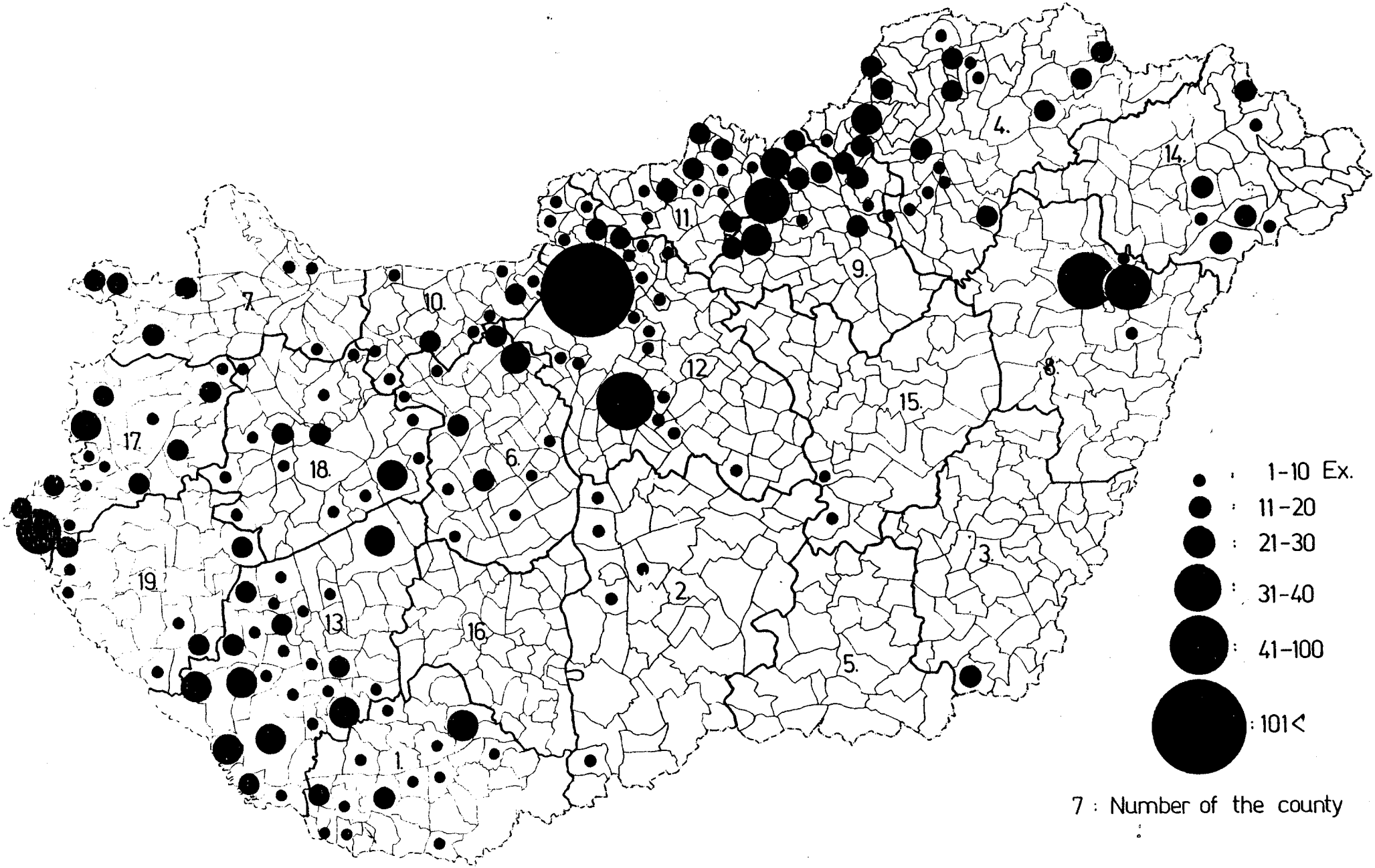

Figure 1: Geographical distribution of woodcock bags in Hungary, 1983.

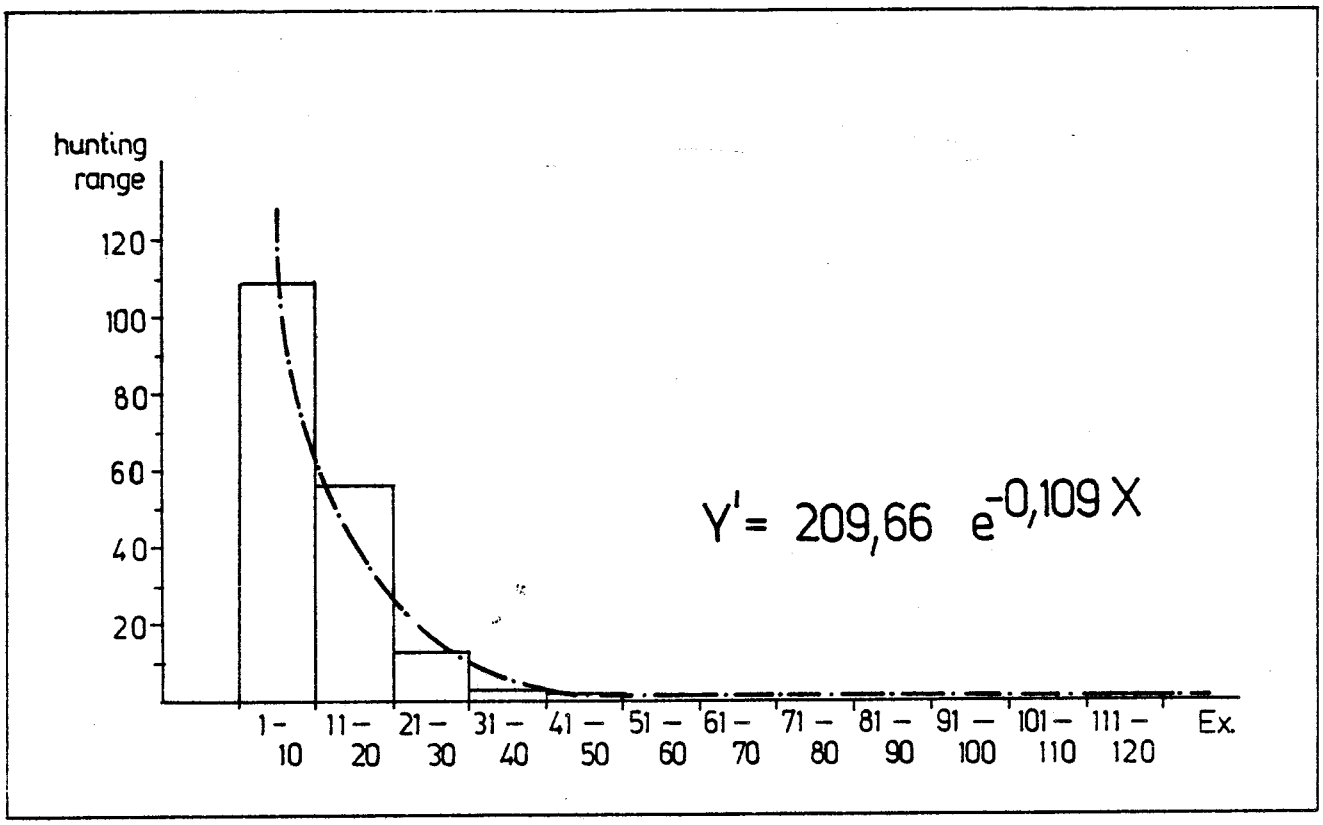

Figure 2: Frequency distribution of woodcock bags in 184 Hungarian hunting districts, 1983.

I will include phenological data in future bag analyses.

Author's adress:

Unibersity of Forestry and Timberindustrie
Dept. of Wildlife Management
H-9401 Sopron
P.O. Box 132
Hungary

NORTH AFRICA

Some notes on the woodcock season 1985/86 in Morocco

Joachim A. Wadsack

First woodcocks were observed as early as October 27 in the region of Larache and Benslimane and November 10 at Sibara/Rommani. The first remarkable influx was recorded by end of November/beginning of December.

Presumably due to the late rainfalls in the lowlands the woodcock were forced to stay in the coastal regions or to migrate to the higher mountains. While only few woodcocks were found in Pays de Zaer, high densities were recorded from the Mamora forest and the Atlas mountains. Only 1 bird per hunting day was flushed in Pays de Zaer, but 8 in the Mamora forest, on average. During the season from November 21, 1985 to March 3, 1986 an average of 5 birds were flushed during 16 days with an average hunting time of four hours with two to three guns. The weight of 28 woodcocks bagged ranged from 275 to 395 grams, with an average of 327 g, which was the highest recorded since 1977. 50% of the birds were juveniles.

Author's adress:

3, rue de Azron
Rabat, Morocco

/M

Management of migratory populations of woodcock and snipe in Morocco

Yussif Alaoui

Situated in the northwesternmost part of Africa, Morocco lies on one of the main routes followed by the migratory avifauna of the western palearctic.
For some species, this country is the final destination whereas for others it is only a stopover on their north-south or south-north bound flight path.
Among these species, two are particularly important from the hunter's point of view: the Woodcock and the Snipe. They are the subject of a special management scheme by the hunting Department of the "Administration des Eaux et Forêts" of Morocco.

Management of Woodcock populations

If the observations and data on the biology and ecology of the Woodcock are comparatively abundant in European countries, this is unfortunately not the case in the southernmost areas of its wintering range. In order to improve this situation the Hunting Department has set up a Woodcock section. Although the latter has not functioned for a long time yet, some interesting results have been obtained which may be added to the data collected in the nesting grounds of the Woodcock.

Concurrently to this research work and observations, the Hunting Department has set up a special management scheme for the wintering woodcock populations. It hereby makes allowance for the now generally accepted notion that migrants are part of the world's natural resources, which can only be managed on an international scale.

Management of Snipe populations

Morocco is an important wintering area for Snipe. Even if the Double Snipe and the Jack Snipe are present, the Common Snipe is the main species among the wintering populations.

The monitoring of these populations is ensured by a special management programme of the Moroccan Hunting Department. Since it is still too early to draw any conclusions, it would be interesting, however, to compare this programme to other management systems in force in the various countries of the Western Palearctic.

Third European Woodcock and Snipe Workshop

October 14-16, 1986, Paris

by H. K.

Following the first symposium 1979 in Denmark and the second 1982 in Britain this third woodcock and snipe workshop was held in France, thanks to an invitation of the Office National de la Chasse. This meeting, held again in a country of great importance for woodcock and snipes has attracted more than 40 participants from eleven countries. The number of papers presented has also increased compared with former meetings.

Our French hosts did everything to make the meeting successful and our stay in Paris enjoyable. Paul Havet, French representative of IWRB, had to carry the burden of the local organisation and he deserves special thanks. On the second day an excursion was sheduled to the famous Forest of Rambouillet, where the French colleagues could demonstrate several ways of catching woodcock for ringing and telemetric studies. These activities as well as the results of the scientific studies presented during the first and the third day demonstrated a considerable progress in our knowledge of these longbilled study subjects. Though most of the papers concerned the woodcock there were also some interesting news on the rarer species, Great snipe and Jack snipe, which were highly appreciated. They indicated on the other hand how much more research has to be done.

Breaks and leisure times were used for informal discussions also concerning practical aspects of management. As expected hunting was controversally discussed by representatives of the Western and Northern European

countries. While the former wanted to let pass hunting woodcock only with pointing dogs, the latter stressed the insignificance for the population, when roding birds are hunting in late spring and summer. Scientific facts presented during this and earlier workshops helped to settle the disputes.

To provide an idea of the scientific part of the meeting to those WSRG-members not having been able to attend some abstracts of the papers presented are given on the following pages. The scientific papers will be published in the Proceedings of this third workshop. They might be available within 1987.

1. Papers on woodcock:

Individual sound recognition of the roding woodcock

Y. Ferrand

Faced with the problem of multiple counts of roding woodcocks, we have tried to distinguish individual males by an acoustic method that has the advantage to avoid capture stress to birds.
Since the calls of the 8 males had been recorded in 3 forests of the Paris Basin at different times and places, it was absolutely certain that these males were not the same birds. Measurements of duration were recorded directly on tape; on the roding call sonagrams, however, the high notes (PSITT) only were registered.
A total of 7 variables were selected.
Discriminant analyses indicate that 3 triplets of variables allow a correct classification of 89.7% of the indicidual birds. Yet, the sonagraphic analysis of the

roding calls of the same bird equipped with a radio transmitter and recorded during a month and a half shows some fluctuation of the variable.
If the proposed method of acoustic recognition resolves only part of the census problems of roding woodcock in a particular site, it should neverthess allow within - year or even between - year monitoring of a few typical birds.

Woodcock display activity and woodcock hunting in Sweden

V. Marcström

Woodcock roding in Sweden continues for 3 1/2 - 4 months without obvious peaks. More than 99% of the roding birds shot are males. They display solitarily over large woodland areas, and when some are removed others increase their activity or start to display. The age ratio of roding males seem to be the same as in the rest of the population. There is no difference in body weight between one-year-old males and older individuals, but the weight of the testes is significantly larger in the latter category.
There are about 23 million hectares of woodcock habitat in Sweden and the population amounts to several hundred thousand individuals. Spring shooting was stopped in 1960 but shooting of roding males in July has been permitted from 1973. The majority of woodcocks shot in Sweden are roding males, and the bag has increased from 4000 to 28000 during the last 12 years. Considering the difficulties of hunting woodcock in our vast woodlands, and the scientific knowledge of roding activity, polygamy, breeding and replacement of shot males, shooting

of roding males toward the end of the roding period is probably the best possible method of harvesting the Swedish woodcock population.

Methods and ringing results of woodcock in Brittany

F. Gossmann, Y. Ferrand, Y. Loidon, G. Sardet

During 3 subsequent winter periods (1983-1986) in Brittany, 203 night trips permitted to ring 389 woodcocks (Scolopax rusticola). At the present time, 92 have been retrieved and 30 were retrapped.
The captures were carried out by using a portable headlight supplied by a battery and, for the greater part, with a net (5m x 5m), sustained by 2 class fiber poles handled by 2 persons. The mean success rate (Number of captures/Number of sighted woodcocks) is 18.6% Three lighting systems were tested and it is a xenon electric arc flashlight which gave the best results (mean success rate = 28.7%).
The darkest nights with hard winds and rain, associated with lesser woodcock activity, allow a maximal success rate (30%).
The mean retrieval rate is 23.6%. It is maximum in December (33.5%) and January (31.5%). Woodcocks ringed in November and December are those which show the greatest retrieval rate, respectively 35.8% and 33.9%.

78% of the woodcocks are retrieved at less than 10 km from the ringing zone and within a mean time-limit of 127 days (only 66 days for birds ringed in November).

The retrapped woodcocks represent 6.7% of the total number of ringed woodcocks. The retrap occur within a mean

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78% of the woodcocks are retrieved at less than 10 km from the ringing zone and within a mean time-limit of 127 days (only 66 days for birds ringed in November).

The retrapped woodcocks represent 6.7% of the total number of ringed woodcocks. The retrap occur within a mean

time-limit of 192 days and a mean distance of 150 m from the ringing zone (53% in the same farmland plots). Out of 30 retraps, 12 occurred more than a year after the ringing date.
Coloured rings were put on 36 woodcocks and permitted 83 observations from which only 2 outside the initial ringing zone.
The retrievals and retraps as well as the coloured rings show the woodcock's fidelity to this wintering area, during the same winter and the following winters. The longer (highly significant) mean time-limit of retrieval for woodcocks ringed in an unhunted area (261 days) compared with the time of retrieved for woodcocks ringed in a hunted area (99 days) indicates an inter- and intra-annual fidelity to the wintering areas. Moreover, the low annual retrieval rate (1.7%) of ringed birds in an unhunted area indicates the importance of birds ringed at the end of their migration, and shows the significant conservation role of the unhunted areas in the precise wintering range.

Woodcock production survey in Britain

J. Harradine

The Woodcock Production Survey in Britain began in 1975/76. Results were first reviewed in the Second European Woodcock and Snipe Workshop meeting in 1982. Since then substantial samples of woodcock wings have been received from Ireland, an important part of the wintering range, and more detailed analyses have been undertaken. Results confirm the value of wing surveys in indicating changes in annual production and geographical patterns in wintering immature and adult woodcock.

Use of woodcock bag statistics for the management of hunted populations

Ch. Fadat

The importance of the shooting pressure on the woodcock in Western Europe and the necessity to monitor their kill in order to maintain a balanced population structure, is an incitation to use woodcock bags as a source of biological data and information for monitoring woodcock populations.
To this end, the intra- and inter-annual variations in population densities, the age- and sex ratios of the woodcock bags have been studied since 1976/77 in France. The biological rationale of each one of these parameters is discussed.
In short, woodcock bags are an important source of information but, nevertheless, insufficient to ensure an effective monitoring of the population, if they are the only data serving this purpose. Other data (habitats, survival) are necessary to complete the information shooting bags may provide.

Correlations between woodcock bag and weather

H. Nyenhuis

In north-west Germany, in a region with highest bag of the Woodcock, two game districts were investigated for the time-file of their autumn bag (1. 1962-1985; 2. 1951-1985). The numbers were correlated with the time-row of years and the monthly temperature (°C) and precipitation (mm).

With regard to the bag and the time as a whole a significant trend can not be obtained. However the last 24 years show more of an upward trend. It can be said: only the weather-conditions are responsible for the annual oscillation of the bagged birds.
Temperatures from November to March have a positive relation, but their correlation with the bag in April is negativ. The effect of the monthly precipitation for the Woodcock abundance in most cases show a pessimistic situation. Very remarkable appears the highest significant positive coefficient for precipitation in November with the bag (District 1). Here, the greater part of bagged birds were migrating at this time. Periods with heavy rain handicap the immigrants in continuing their way to the South. To support this thesis, analysis with 24 n of cases, illustrated by scattergrams, for the district 2 were conducted.

Use of bag statistics for the evaluation of the diurnal habitat of wintering woodcock

G. Imbert

In the Boulogne-sur-Mer State forest, with high concentrations of woodcock, it has been possible to establish a correlation between the locations of the birds and some habitat factors, thanks to the bags of woodcocks taken between 1979 and 1986.
Despite the study area being too small, which made any generalization of the results impossible, it is interesting to note that:

- The mean cluster of woodcock locations has been changing sites every year, a fact which is par-

tially due to aging of the coppice;
- the sex-ratio shows a 90% inverse correlation with the gradient of the mean slope of the ground;
- Woodcock avoid habitats with copsewood less than 7 years or over 20 years old, as well as habitats without coppice;
- the most favourable age of a copsewood is between 9 and 15 years;
- Woodcock like to dwell in locations sheltered from the wind;
- extreme weather conditions are unfavourable to its settlement.

This work may be used to carry out similar studies in other areas, the syntheses of which may give us an idea of the average habitat type of the wintering woodcock.

Changes in the diet of the wintering woodcock

P. Granval

With the help of a new method based on counts to earthworm setae, the diurnal diet of the woodcock was investigated. To this end, we analysed 384 stomach contents from the Mediterranean coast and the western part of France.
Earthworms are the main food item in the diet of the wintering woodcock (85% of the energy intake), whatever the habitat type.
A multivariate analysis (A.F.C.) allowed to bring out the main factors responsible for changes in the diet (place, hunting season and the bird's sex). Millipedes (Myriapoda) and wireworms, which are very abundant in the stomach contents of the Mediterranean birds are re-

placed in part by earwigs (Dermaptera) and fly larvae (Diptera) in the western part of France. In winter millipedes and wireworms are less abundant.
The overall diet differs according to sex, the difference being more marked in forested mountain habitats. In the Fréau forest (Finistère) the spatial distribution changes with sex. Thus, the valley bottoms are frequented by a majority of females whereas the males are more numerous on the hillsides and the plateaus. Whether this be the cause or the effect of the spatial distribution, the diet of either sex is different. Females eat more insect larvae, millipedes and earthworms than males during dry autumns and harsh winters. This could be one of the reasons why females migrate earlier than males.

Spatial distribution of woodcocks in their nocturnal habitats in Brittany

Y. Ferrand and F. Gossmann

The spatial distribution of woodcocks in the nocturnal habitats, was studied in an area of 86 ha, situated in the South of Brittany. From October 1984 to March 1985, 12 trips permitted to record 104 birds, by using a portable headlight supplied by a battery.
The maximum number of birds present was obtained in December and January, except during the cold-wave in 1985.
The presence of woodcocks was recorded in 23 farmland plots, but only 3 were occupied during more than 50% of the trips. The total number of contacts recorded in a farmland plot is not random. The permanent meadows are clearly preferred to the temporary meadows and the cultivated fields which are deserted. Moreover, some

parts of permanent meadows only are utilized.

The selective distribution compared with the available habitats and the agregative distribution on the preferred habitats may be linked to the feeding potentialities.

Relative importance of the biomass density of lumbricidae in nocturnal roosting grounds frequented or not by the woodcock

P. Granval

After a three-year census of woodcock numbers in nocturnal roosting grounds in the west of France, we sampled the populations of earthworms in open and forested habitats by a physical-ethological method of collection (sprinkle with formaline, then dig to collect 20 cm deep soil samples; a total of 70 samples was collected on a 0.5 m^2 surface area).
Woodcock select habitats with the highest densities of Lumbricidae (1.400 kg/ha). Biomass is rather scarce (140 kg/ha) in deserted habitats, this being the result of an all cereal crop rotation without any soil improvement with organic matter.
The forested habitats in Fréau (Finistère) have low biomass densities (100 kg/ha). The presence of meadows seems necessary to maintain a wintering population of woodcock.

For the first time researchers from Eastern Europe (USSR and Romania) had registered for the Workshop, announced a paper, but finally were not able to participate. The

following two abstracts shall at least inform about their activities (the abstract concerning Morocco by Y. Aloui, who also could not attend is given under National Notes, North Africa).

On the description of Woodcock and Snipes down nestlings

V.Yu. Ilyashenko (USSR)

The studying of morphological variation of nestlings require unification of their description. It is also very important for determining the range of variation, the stable diagnostic characteristics and phylogenetic relations. Now nestlings are described with such indistinct terms, as "crow-cap", "middorsal line", "crop bar" and so on, or only illustrations are presented.

Woodcock and Snipes nestlings natal dress (neossoptiles) are determined with feather strutures-preapannae. As preapannae are predecessors of pennae, and they dispose only on the pteryles, so methodologically correct is discribe natal dress, using only pterylographical characteristics for adult and terminology from "Nomina anatomica avium" (1979).
In group, we are interested preaplumulaeare poor development (the least degrees and measures). For example, in Woodcocks these structures appear only on lateral apteria (apteria truncale laterale).
It is necessary to discriminate two types of juvenal feather structures. The first type structure replace natal down, the second tine structure arise between natal down.

Data concerning the food of Woodcock in North Dobrogea (Romania)

J. Kiss and K.J. Botond

Using the stomach content analysing method, the authors have studied the food of woodcock (Scolopax rusticola L.)

in North Dobrogea (Romania). There have been investigated 194 gastro-intestinal samples collected in the following ways: 3% shot during the twilight flight, 5% in the time of organized hunts and 92% collected using hunting dogs (hungarian "vizsla"). The results of qualitative and quantitative analysis are included in three tables, separated on seasons, when the species are present in North Dobrogea: autumn, winter and spring, in decreasing order of the analysis number. A wide range of food components, over 120, was identified, from which 25% of vegetal origin, the rest of animalorigin. Because of its complex food, the woodcock adapts itself to different biotope types, which it meets during the passage, where it fits organically in this trofic nets.

2. Papers on Snipes:

The Distribution, status, movements and habitat of Jack Snipe, Common Snipe and Pintail Snipe in Africa

P.B. Taylor

Jack Snipe (Lymnocryptes minimus) and Common Snipe (Gallinago gallinago) are regular wintering birds in Africa, occurring over much of the Afrotropical region. Compared with our knowledge of these birds in the western palaearctic, little is known of them in Africa, but enough information exists to give a picture of distribution, status, movements and habitat in the continent. This paper reviews existing literature and also gives details of observations of these species in Zambia and Kenya.

Jack Snipe is normally thinly distributed in sub-Saharan Africa, occurs from September to April, and occasionally occurs as far south as Zambia. It requires wet muddy habitat with low to tall cover, normally at fresh-water sites but occasionally at alkaline lakes. Common Snipe winters in large numbers south of the Sahara, where it

is recorded as far south as Zambia. It occurs from August to April, passage being recorded in September-November and February-April. It is easily confused with African Snipe (G.nigripennis) in the wintering areas, where habitat is shared with this species and with Jack Snipe. Common Snipe occurs in habitats with shallow water, soft soil or mud, and good cover of low herbage, reedbeds or shrubs.
Most Pintail Snipe (G. stenura) winter in Asia but the species was recorded from Kenya on several occasions in 1981-1983; it cannot be regarded as only a very rare vagrant to Africa. Kenya records, with others from the Middle East and from Indian Oceanic islands, suggest a trans Indian Ocean movement as well as a small migration over the Middle East. The species may occur in drier habitat than that frequented by the other two species.

Snipe migration, ringing recoveries, and some bag statistics in Italy

R. Massoli-Novelli

1961-1985 author's bag statistics and field observations in Sardinia are discussed. Data regard 2.834 Common Snipe (Gallinago gallinago), 112 Jack Snipe (Lymnocryptes minimus) and 22 Great Snipe (Gallinago media) bagged during 25 years in the same three wetlands.
Sardinia migration periods diagrams confronted with similar statistics from central Italy (Abruzzo) plateau show a late spring migration in mountain wetlands as to coastal areas.
Migration periods diagrams in Sardinia, compared with similar diagrams referring to all the ringed snipes recovered till now in Italy, show a good coincidence. Ringing data regard 307 Common Snipe, 17 Jack Snipe, 6 Great Snipe. All snipes are ringed in other countries. Considering the source, migration routes for Italy are discussed.

Status and habitat of great snipe in Ethiopia and its movements in Africa

R. Massoli-Novelli

Great Snipe (Gallinago media) migrate to Ethiopian highlands during the raining season, from early August till mid-October, in exceptionally large numbers. Its habitat are flooded grasslands which constitute about 6% of the volcanic plateau, between 1.500 and 2.700 m altitude. The author's counts are in good agreement with 1965-1983 bag statistics for the same areas and with some few data of 1913-1941: G. media's exceptional migrations to the Ethiopiah plateau seem to be stable and constant during the last seventy years.
Great Snipe are typical "rain" birds and their concentration in Ethiopian highlands may be explained by two fundamental ecological factors: distribution of rainfall in Africa in June - September and the presence of large grasslands. Movements in Africa and spring migration in Mediterranean countries, likewise, show the same trend, to follow the long rains.

Habitat use by the snipe (Gallinago gallinago) in the inter-breeding season

P. Grisser

As part of a study on wintering Snipe in France we investigated the use of space by this species in its overwinter quarters. Snipe-habitat relationships were mainly studied in 3 areas in the Gironde region (Southwestern France). Site selection criteria were studied for a wide range of habitat types and their importance was assessed in relation to the utilization of these sites by the Snipe. We also took soil samples in order to quantify the insect fauna.

The following factors appear to be essential: the penetrability of the soil, the height of the vegetation cover (between 5-25 cm) and the size of water-covered stretches of land which should be in agreement with the morphological and behavioural characteristics of the Snipe. The penetrability and the dimension of the grounds accessible to Snipe are important for their feeding habits. Herbaceous strata over 5 cm high, the microrelief, the area surface covered with water and the way the latter are distributed are important for their safety and comfort. As environmental conditions govern habitat use, wintering will only take place if Snipe may use habitats with sufficient space for roosting and feeding. The general activity pattern of wintering, day-time resting and night feeding adapts to disturbances on the feeding sites during the day, so that Snipe may take advantage of the nocturnal vertical migration of some prey, like the earthworm.
In winter, the energy requirements may force Woodcock to feed longer. Either the birds disperse towards the nocturnal feeding areas, which are however limited by factors of disturbance (i.e. hunting), or the birds select small, diurnal roosting sites which offer good possibilities for feeding. If these 2 solutions are not available and if the birds cannot feed on intertidal wetlands, they disappear.

Some aspects of the diet of snipes

J. Veiga

Stomach contents of 348 Common Snipes (Gallinago gallinago) and 76 Jack Snipes (Lymnocryptes minimus) were analysed. These birds were shot during the hunting season on several types of French wetlands.
The different items found in Snipe stomachs are:

- Mineral items (grit, shells fragments and lead shot)
- Several items (vegetative part and seeds of several

species),
- animal preys (mainly worms, molluscs, insects and crustaceans).

The frequency (%) of each prey has been calculated, and their role is discussed. Grit is used to triturate the hard parts of food, but some calcium-rich items can be assimilated with the help of stomach acidity. Lead shots are probably ingested by error (mistaken for grit, seeds or small gastropods). They may cause lead poisoning. Plant fibres are a binder in rejected pellets. Until now, seeds were not considered as food for Snipes. But their number and high frequency in stomachs, added to their high energy value lead to think that the seeds may be deliberately taken as food items.
Animal prey are an important part of the diet of Snipes. Insects are intensely taken as prey in all the localities studied. The Diptera and aquatic coleoptera are most frequent. Worms are also often taken, and their frequency may be under-estimated because of methodological bias. Small gastropods can be taken in localities where they are abundant. Other preys are more rarely found: crustaceans, spiders and related items, small fishes.
In the same locality, Jack Snipe's diet is less variable than Common Snipe's. The Jack Snipe seems to be more interested in small gastropods.
The Common Snipe's diet changes during the hunting season, according to the availability of local prey.
The amount of food needed by a Common Snipe is not known but can be estimated from energy appraisals. The energy costs of each kind of activity can be calculated according to its importance in the time-budget and in comparison to basal metabolism. A simplified model was used to estimate Snipe's energy need.

Ageing and sexing of common snipe (Gallinago gallinago)

Ib Clausager

A total of 86 Common Snipe bagged during the hunting sea-

sons 1980-1984 were examined with the aim to find external age and sex criterions.
During the months August - December it is possible to age the Common Snipe from the wing alone.
Sexing is more questionnable. However, by using the total length of the outermost tailfeather and the ratio between the total length of the outermost and the next tailfeather, 86.7% of the juveniles were correctly sexed. Of the adults 73.3% were correctly sexed only by using the total length of the outermost tailfeather.
From aged wing samples collected in Denmark during the period 1979-1985 annual index for the reproduction is calculated as well as the temporal distribution of juveniles and adults.

BIBLIOGRAPHY

Cade, B.S. (1985): Habitat suitablity index models: American Woodcock (wintering). U.S.Fish Wildl.Serv. Biol.Rep. 82(10.105), 23 pp. (U.S. Fish & Wildl. Serv., W.E.L.U.T., Drake Creekside Building One, Fort Collins, CO 80526-2899, USA).

G.H.

Dahlen, B. (1983): Dvärgbeckasin. Gråspetten 3: 92-99 (in Swedish).
Notes on the distribution of the Jack Snipe (Lymnocryptes minimus) in Northern Sweden, a possible first breeding record in Ångermanland in 1983 and observations on the display behaviour of this species.

W.Thiede

Devort, M., M. Trolliet & J. Veiga (1986): Les Becassines et leurs chasses. 367 pp. Editions de l'orée, Bordeaux.
This precious book, illustrated with many color-plates provides an extensive view to the variety of species and sub-species of snipes all over the world. Morphology, migration and breeding biology are described as well as hunting aspects worldwide, filling up half of the book.

H.K.

Elveland, J. & M. Tjernberg (1984): (The vegetation on some display grounds of the Great Snipe, Gallinago media, in Sweden).
Mem.Soc.Fauna Flora Fenn. 60: 125-140 In Swedish with English Summary. (Inst. Ekol. Bot., Umea Univ., S-90187 Umea, Sweden).

G.H.

Ferrand, Y. & Ph. Landry (1986): Repartition spatio-temporelle des Becasses des bois (Scolopax rusticola L.) a la croule en Foret Domaniale de Rambouillet (Yveli-

nes). Gibier Faune Sauvage 3: 115-141. In French with English summary.

The spatial distribution pattern of roding woodcock in the Forest of Rambouillet was assessed by observing at 69 locations distributed over 5500 ha in the period March-June. Seasonal trends in the number of roding observations were similar for each location. However, the observations of roding woodcock were not evenly distributed over the study area. Some sectors were flown over regulary by displaying birds, others only intermittently, and between-site differences in the number of roding observations suggested that displaying males were concentrating their activities over particular areas. This spatial variation was related to habitat characteristics. Many conifer stands were avoided by roding hornbeam with plenty of openings in the centre of the forest. These are also the areas most favourable for nesting.

G.H.

Fincher, F. (1985): Roding at night and vertival escape flight of woodcock. Brit. Birds 78: 195.

G.H.

Green, R.E. (1985): Estimating the abundance of breeding Snipe. Bird Study 32: 141-149.

Counts of drumming snipe were compared with estimates of nest density based on repeated searches by rope-dragging and by a mark-recapture study of snipe chicks. Mean density of drumming snipe early in the nesting season was about half the eventual peak nest density.

G.H.

Green, R.E. (1985): Growth of snipe chicks Gallinago gallinago. Ring & Migr. 6: 1-5.

The weight of newly hatched chicks was correlated with the estimated fresh weight of the eggs from which they hatched. Newly hatched chicks typically weighed 68.6% of fresh egg weight. Mean weight of

chicks declined slightly from hatching to one day old. Subsequent growth was best described by a Gompertz equation. Unlike weight, bill length increased significantly from hatching to one day old. The full-grown bill length was attained at around 45-50 days. The mean error from ageing unfledged chicks (<20 days old) by bill length was 0.8 days (max. 3 days) and that for weight 0.6 days (max 2.1 days).

G.H.

Grisser, P. (1985): La Becassine de marais (Gallinago gallinago L.). Analyse bibliographie. Bull.mens.O.N.C. 93: 21-35; 94: 7-15, 95: 7-26. In French (Conc-Cera Oiseaux d'Eaux, Reserve de Chanteloup, 85340 Olonne sur Mer, France).

G.H.

Grisser, P., G. Trolliet & J. Veiga (1984): Une etude des relations entre stationnements et prelevements cynegetiques chez le Becassine de marais (Gallinago gallinago), en Gironde. (A study of the relationships between occurence and hunting pressure of Common Snipe in Gironde.) Bull. mens. O.N.C. 85: 16-21. In French.

G.H.

Holden, P. (1985): Measurements of wing-span. Brit.Birds 78: 403-404. Includes snipe and woodcock as examples.

G.H.

Hudgins, J.E., G.L. Storm & J.S. Wakeley (1985): Local movements and diurnal-habitat selection by male American Woodcock in Pennsylvania. J.Wildl.Manage. 49: 614-419.

Habitat variables were measured at diurnal locations of radio-tagged birds and compared with those for random sites. A logistic-regression model based on 7 habitat variables correctly identified 92.3% of the observations. Number of worms, density of small shrubs and density of trees were the most important of the

discriminating variables. For singing males the median distance between diurnal sites and singing grounds was 364 m. The total diurnal area utilised by 12 birds tracked for 10-30 days (obtained by summing the areas of diurnal activity centres) ranged from 0.07-1.37 ha (median 0.27 ha) and total home range from 0.3-171.2 ha.

G.H.

Keppie, D.M. & G.W. Redmond (1985): Body weight and the possession of territory for male American Woodcock. Condor 87: 287-290.

Body weights were obtained for 213 male American Woodcock displaying on territories in coniferous forest in New Brunswick. Weights were not different between yearling and adult males, between the first males removed and new birds moving onto their territories, or between males on territories rated as high-activity and those on territories where activity was low. Weights differed seasonally only in certain years. It is concluded that body weight does not influence the ability of male woodcock to occupy a territory.

G.H.

Kiss, J.B. & I. Sterbetz (1978): Data on the feeding of the Woodcock (Scolopax rusticola). Aquila 85: 107-112.

Analysis of the contents of 123 woodcock stomachs from Hungary (mainly spring) and 113 from Roumania (mainly autumn and winter) according to season. Thirty-six percent of the spring sample contained earthworms but only 9% of the autumn and none of the winter sample. There is no information on the time of day of collection, nor the methods used.

G.H.

Lofaldi, L. (1985): Incubation rhythms in the Great Snipe Gallinago media. Holarc. Ecol. 8: 107-112.

The incubation rhythms of four females were monitored by placing thermistors in the nest. On average daily incubation constancy was 90.3% and the mean daily time off the nest 139.8 ± 28.8 minutes. The number of incubation breaks per day averaged 8.7 with a mean duration of 15.7 minutes. Generally birds incubated for long bouts during the night, and left the nest frequently during daylight. Departures were concentrated in the warmest part of the day in cool periods, but were more evenly distributed throughout the day in warmer periods.

G.H.

Marcström, V. & F. Sundgren (1977): On the reproduction of the European Woodcock. Viltrevy 10/2: 27-40.

33 woodcock nests found in Central Sweden were examined for nest site selection, clutch size, timing of egg-laying, brooding etc. Some of the clutches were hatched in an incubator to record weight decrease during hatching and incubation periods. The chicks seemed to be unable to feed themselves during the first days of life, but had to be fed artificially or by older woodcocks. In one case a young female, only 26 days old, started feeding the younger relatives. This was also done by 10 months old males in two other cases. With increasing bill length the chicks started probing for earthworms themselves and were more or less independet by an age of two weeks. The authors conclude periods of dry weather might be quite detrimental to small woodcock chicks, by aggravating their search for food. They cite corresponding observations from the dry summer of 1971.

H.K.

Massoli-Novelli, R. (1985): Il croccolone (Gallinago media) in Etiopia. Gli Uccelli d'Italia X, 1/2: 30-37 (The Great Snipe in Ethiopia). Italian, with English summary (below):

Great Snipe (Gallinago media) migrate to Ethiopia highlands during the rainy season, from early August till mid-October, in exceptionally large numbers. Its habitat are flooded grasslands which constitute 6% of the volcanic plateau, between 1.500 and 2.700 m altitude.
A density of 1.300 ± 300 birds/km² has been found in two areas: a conservative estimate implies a total number of ten million in the whole of Ethiopia in September. The author's counts are in good agreement with 1965-1983 bag statistics for the same areas and with a few data for 1913-1941: G.media population in Ethiopia seems stable in last seventy years, and perhaps it is increasing. Hunting pressure is low and habitat (grasslands) till now is practically the same as last century. Conservation of this particular habitat from usual alterations (drainages, expanding agriculture) is highly needed to maintain the status of Great Snipe.

H.K.

McKibben, L.A. & P. Hoffmann (1985): Breeding range and population studies of the Common Snipe in California. Calif.Fish.Game 71: 6-75. (Calif.Dept.Fish & Game, 468 Justeson Rd., Gridley 95948, USA).

G.H.

Morgenweck, R.O. & W.H. Marshall (1984): Observations on postures and movements of non-breeding American woodcock. Wilson Bull. 96: 720-723. Precise descriptions of a range of postures, movements and associated activities of American Woodcock, usually of known sex, observed or photographed through a night vision scope in late summer and early spring. Also describes the behaviour of a woodcock watched feeding by day which used beak and foot to flick over leaves.

G.H.

Nyenhuis, H. (1986): Atlas der Waldschnepfenstrecken (Scolopax rusticola) in Nordrhein-Westfalen (Atlas of woodcock bags in Nordrhein-Westfalen, FRG). Empirische Tierökologie (edited by the author) 2, 42 pp.
Geographical distribution of woodcock bags in a western province of FRG, documented by annual maps from 1951-1985. The conclusions of the author, derived from complicated mathematical calculations are not explained and thus difficult to understand.

H.K.

Parris, R.W. (1985): A case of Woodcock mortality possibly due to weather. Kingbird 35: 255-256 (Dept. Environm.& For., Syracuse 13210, USA).

G.H.

Petitclerc, P. (1925): Note d'ornithologie. Remarques et observations sur l'habitat, les moeurs, la migration, etc. de la Becassine double (Gallinago media). Editions bossard, Paris, 87 pp.
A monography on the great snipe according to data available after the turn of the century. Morphological data, records concerning breeding biology and migration. This species obviously has been a rare migrant in western Europe all the time, and only occassionally was bagged during snipe hunting. List of study skins in European museums.

H.K.

Reed, T.M. (1986): Diurnal and seasonal variability in the breeding behaviour and detectability of Snipe. Wader Study Group Bull. 46: 15-17.
Population estimates of Snipe (Gallinago gallinago) in a British study area were subject to great variability of the sounds uttered by the birds during the day as well as during the season. Drumming is most intensive at dusk, decreasing rapidly during the day, but also as egg-laying progresses. Other sounds, recorded later in the day showed less variation. Late morning counts should therefor also be considered in population estimates.

Schandy, T. (1984): (Occurrence and habitat choice of Great Snipe on Hardangervidda.) Var Fuglefauna 7: 205-208. In Norwegian.
On the Hardangervidda mountain plateau (1000 -1200 m asl.) in southern Norway the Great Snipe occurs in mosaic habitats with bogs, dwarf willow and birch scrub, and dry heath vegetation in the lower alpine zone. Seven leks were found in 1982 and 1983 totalling 70-83 birds. Leks were situated in boggy south-facing, gently sloping terrain. The population is thought to be increasing.

G.H.

Shissler, B.P. & D.E. Samuel (1983): Observations of male woodcock on singing grounds. Wilson Bull. 95: 655-656.
Individually colour-banded male American woodcock were frequently seen displaying at two or more singing grounds located 100-210 m apart. Some birds alternated between sites during the same display period or from one day to the next.

G.H.

Shissler, B.P. & D.E. Samuel (1985): Effectiveness of American Woodcock survey routes in detecting active singing grounds. Wildl. Soc. Bull. 134: 157-160. (Wildl.Manage., RD 1, Box 114, Conestoga, PA 17516, USA).

G.H.

Shuler, J.F., D.E. Samuel & M.R. Ellingwood (1986): A modified nightlighting technique for male American Woodcock. J.Wildl.Manage. 50: 384-387.
A combination of tape player (using a woodcook soundtrack), long-handled net and aircraft landing light was used to capture male woodcock on singing grounds. Capture rate was 2.75 birds/hour. The method was considered to be safe (low rates of singing ground desertion compared with mist-netting) inexpensive and efficient (can be used throughout the night).

G.H.

Straw, A.J.Jr., S.J. Wakeley & J.E. Hudgins (1986): A model for management of diurnal habitat for American Woodcock in Pennsylvania. J.Wildl.Manage. 50: 378-383.

In spring woodcock preferred areas with 12-17% bare ground, 32% coverage of large shrubs, 5200-7400 saplings/ha and 75-84% canopy closure and avoided areas with 2% bare ground, 12% coverage of small or large shrubs, 1500 saplings/ha, 20 m^2/ha basal area, and 50 or 90% canopy closure. Optimum levels of basal area and sapling density were estimated to be 14.3 m^2/ha and 4900 stems/ha respectively. It is suggested that uneven-aged forest management may be appropriate for maintaining diurnal habitat for woodcock in Pennsylvania.

G.H.

Texeira, D.M., M.E.M. Puga & J.B. Nacinovic (1983): (Notes on the biology of the Great Snipe (Gallinago undulata gigantae)). An.Soc.Sulrio-grandense Ornitol. 4: 7-9. In Portuguese with English summary.

G.H.

Veiga, J. (1985): (Diet of the Jack Snipe (Lymnocryptes minimus).) Gibier Faune Sauvage 1985(1): 75-84. In French with English summary.

Analysis of the stomach contents of 76 Jack Snipe shot at five French localities. Gasteropods were found in 43% of stomachs, dipteran larvae in 36% and beetles in 32%. The seeds of aquatic plants may also be important food items and were found in 53% of stomachs. At one site 6 out of 37 stomachs examined contained lead shot. It was concluded that in general Jack Snipe are less opportunistic in their feeding habits than Common Snipe.

G.H.

Wiley, E, II & M.K. Causey (1985): Mortality of American Woodcock chicks in Alabama. J.Ala.Acad.Sci. 56: 91 (Dept, Zool.-Entomol., Auburn Univ., Auburn Al 36849, USA).

G.H.