INTERNATIONAL WATERFOWL RESEARCH BUREAU

WOODCOCK & SNIPE RESEARCH GROUP

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International Waterfowl and Wetland Research Bureau

WOODCOCK AND SNIPE RESEARCH GROUP

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EDITORIAL

This Newsletter number fourteen of the Woodcock and Snipe Research Group (WSRG) shall inform about research going on and sheduled, preliminary results, short notes of interest and recent publications.

Meetings

At the 35th General Assembly of the International Council for Game and Wildlife Conservation (C.I.C.), May 17 to 21, 1988 at Florence (Italy) the coordinator reported on preliminary results of the International Woodcock Project (p. 3), which was mainly financed by CIC. A more extensive report was given during the 6th meeting of the Working Group of the Western Palearctic Flyway within the Migratory Bird Commission of CIC at Dakar (Senegal), December 12 to 17, 1988. It was at Dakar, when this project was sheduled in April 1985, thanks to the financial support of the Working Group offering to take over half of the costs during the three years of the project.

Research

During 1988 the International Woodcock Project was completed mainly by the joint coordinator, who was assisted by John Ellis in the British study area at Whitwell Wood (see p. 3). Due to the joint coordinator's new occupation this project can not be extended. However, there is some hope to continue at least monitoring the birds ringed at Whitwell Wood by staff of the Game Conservancy in Fordingbridge (England). We want to take this opportunity to thank all the contributing organisations for their assistance.
Woodcock wing sampling is carried on in several European countries, as Denmark, France and Britain. These studies

are coordinated and evaluated by Dr. John Harradine (B.A. S.C., Marford Mill, UK), coordinator of the Duck Wing Research Group of IWRB.
Extensive woodcock studies under several aspects are conducted in France by the Office National de la Chasse (ONC). We intend to intensify our contacts to the French colleagues.
This issue contains a draft of the American Woodcock Management Plan (p. 20), which was provided by the new Director of IWRB, Dr. Mike Moser. This plan exhibits interesting aspects of conservation measures that could stimulate research activities on the European species. It further shows how far harvesting is integrated in all management considerations.
We further got knowledge on harvest strategies in the USSR, the main breeding range of the European woodcock (p. 30).

Publications

Proceedings of the Third Woodcock and Snipe Workshop (1986, Paris) are available now, either from IWRB-headquarters (Slimbridge, UK) or from the coordinator.

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INTERNATIONAL WOODCOCK PROJECT: SUMMARY REPORT FOR 1988

Long-term population study, Whitwell Wood, Derbyshire

27 full-grown birds and one juvenile were trapped during the 1988 breeding season, including seven ringed in previous years (four from 1987 and three from 1986). 40 chicks from 12 broods were also ringed, weighed and measured. These figures bring the number of woodcock ringed in Whitwell since 1978 to 184 full-grown birds and 160 chicks.

By using published estimates of annual survival the number of ringed birds at risk of being shot each winter can be calculated. To date 16 of the birds marked when full-grown have been reported shot from a total of 220 bird-winters (7.3%). 12 of the birds were shot within 25 km of Whitwell. Of the remainder, two were shot in Ireland in the winter, one shot in Sweden in July and one in Estonia in May. All four birds were ringed between 16 March - 10 April suggesting passage from Ireland across northern England at this time. The Swedish bird was radio-tagged on 16 March and left the Whitwell area on 30 March.

14 nests were found in Whitwell in 1988 (including four after hatching) bringing the grand total since the study began to 55. In contrast to earlier years, all the nests were successful in hatching young. This and the fact that roding continued until 8 August indicate a better than average breeding season presumably due to the mild, moist spring and summer. Breeding success (Mayfield method) for the whole sample of nests found in Whitwell is estimated to be 50.5% ie. about half the nesting attempts in Whitwell hatch at least one chick.

Assessing woodcock densities and harvest rates in winter

Most European avian quarry species are comparatively simple to census during the key phases of their annual cycle eg. before and after the breeding season, and consequently their population dynamics are relatively easily studied. In contrast, a solitary woodland existence, cryptic coloration and behaviour, and crepuscular habits combine to make woodcock notoriously difficult to census at any season. In last year's Newsletter we presented the first results of a new study into establishing ways of assessing woodcock densities and harvest rates in winter. Here we present some findings from our second winter's work.

Most of our intensive research has been undertaken in S.W. Cornwall. Here the woodcock is a common winter visitor occurring at densities high enough to support shoots concentrating solely on this species. This makes the development and validation of methodology easier than elsewhere in Britain where woodcock densities are usually lower. During November to January inclusive we searched pasture fields at night for woodcock on four estates on the Lizard peninsula and ringed 58 birds on two of them. After the main period of arrival (around 19 November) and before most shoots had taken place, the density of birds on pasture in

the four areas was very similar (21.2-23.8 birds/sq km; mean 23.0 birds/sq km).

On the two estates where we marked birds, harvest rates over the whole shooting season were estimated to be 46% and 23% respectively; we estimated 65% for the former estate in 1987-88. Six of the 34 birds ringed on the two estates last winter were shot there this winter. This is about the number expected if all the birds surviving from last year had returned to the same estates to winter. Although the estates are only 4 km apart, no movements of marked woodcock between the two areas have yet been recorded, and the mean distance between the place of ringing and shooting for birds marked this winter was only 740 m (range 250-1875 m). Given this extreme site fidelity within and between winters, high shooting pressure should maintain a high young:old ratio, since although relatively few birds will return as adults the following winter, the year's recruitment of young should continue to arrive. As expected the ratio of young to old birds in the sample of birds trapped was markedly higher on the estate with the higher shooting pressure (2.7:1 vs. 1.4:1).

On one estate, a high proportion of the season's bag is taken in a well-defined area on just one day. By having a reasonable number of marked birds, and by recording the number of birds flushed during the shoot, we can obtain independent estimates of the number of birds present with which to compare the density estimates obtained from counts of birds on pasture at night. The estimate of woodcock density on pasture before shooting from a mark-recapture analysis (Lincoln Index) was 40.9 birds/sq. km and from the number of birds flushed during shooting, 34.4 birds/sq km, compared with the estimate from counts on fields of 23.8 birds/sq km. Thus the efficiency of field counts is probably somewhere in the region of 58 - 69%. In 1987 efficiency was estimated to be 59%. This degree of underestimation is not surprising since not all birds will be feeding on pasture fields and some birds that are will be missed by the observer. Estimates of the proportion of woodcock present in the area which were shot on the day of the main shoot were 42.9% (from the number of ringed birds at risk that were shot), 51.1% (from counting the number of birds flushed) and 53.4% (from field counts before and after shooting).

It is interesting to compare the above estimates with those for last winter. The number of birds present on the main day estimated from the number flushed was 31% higher this year, the number estimated by the Lincoln Index method was 56% higher, the number shot on the main day was 32% higher and the density estimate derived from counting birds on pasture was 30% higher. The similarity of the estimates is striking, suggesting that on this estate the 1988-89 season was considerably better for woodcock than the previous one. In previous years the number of birds shot on the main day on this estate has been significantly correlated with the proportion of young in wings received from the whole of southwest England ($r_s = 0.625$; $P = < 0.01$; $n=13$). As expected the proportion of young in the bag on the main day

(79.1%) was higher than last year (72.1%).

Densities of woodcock on the frost-free pastures of the Lizard peninsula are atypically high compared with most of Britain. In Norfolk and Derbyshire densities on pasture in November/December 1988 were only 4.3 and 3.5 birds/sq km respectively. The latter figure was 9% higher than in 1987. In 1987 the density of woodcock on rough grazing in the Peak District, Derbyshire was 2.7 birds/sq km. From these estimates, assuming an efficiency of locating woodcock on fields at night of 59% and using published figures for the amount of pasture and rough grazing, the number of woodcock in England, Scotland and Wales combined at the start of the 1988-89 shooting season was probably in the order of 6-800,000 birds. Hepburn (1983) estimated the average woodcock bag per winter in the Britain and Ireland to be around 150,000 birds. This would suggest a somewhat higher percentage of woodcock shot per annum than the figure of 7.3% derived from birds ringed in Derbyshire in summer (see above). However, the latter figure makes no allowance for the number of recoveries of shot birds not reported.

The research carried out in Cornwall during the last two winters suggests that it might be feasible to estimate woodcock densities in representative areas of Britain from the number of birds flushed during the course of shoots and/or from counting birds on pasture fields at night. This would enable us to determine more accurately than at present the proportion of woodcock that are shot in Britain, trends in population size, factors which affect woodcock density in winter, relationships between woodcock density and harvest rates, and the relationship beween age ratios in the bag and shooting pressure.

Acknowledgements:

We should like to thank the Forestry Commission, in particular Mr. D.A. Greig for granting us permission to work in Whitwell, and the Cornish landowners who allowed us to count and catch woodcock on their estates. As usual, Herby Kalchreuter and Peter Bickford-Smith provided much support and encouragement. We are particularly grateful to the various national CIC delegations and the Game Conservancy for providing the financial support without which this research could not have been carried out.

Graham Hirons, Mark Linsley and John Ellis

Ref.

Hepburn, I. 1983. Hunting bags and population of woodcock in Europe. In Kalchreuter, H (ed.). Proceedings of Second European Woodcock and Snipe Workshop. pp138-145. Slimbridge: IWRB.

NATIONAL NOTES

AUSTRIA

Some observations on Woodcock migration in Austria and Western Hungary, 1987.

Philipp Meran

Spring migration: Due to a late winter extending almost until the end of March, woodcocks generally arrived late. In the lowlands of Burgenland there were only few observations end of March, but in the mountainous areas (Leitha mountains, Eisenstadt, Klingenbach) more birds were seen roding than in many years before. Starting in March 23, observations peaked on March 30 and 31 and again between April 11 and 15. 30 woodcocks had been bagged near Eisenstadt. In Western Austria especially in the lowland forests along the river Salzach north of Salzburg an unpreceded number of woodcock were seen. At one place 30 to 40 observations were made per evening over almost a week. Similarly, above average migration was observed in the lowlands of Western Hungary after April 2.
The following table lists woodcock shot during roding in spring 1987.

Date	Location	Weight (gr.)	Sex	Age	Bill length (cm)
29.3.	Balatonfenyves	315	♂	juv.	7.2
29.3.	Balatonfenyves	345	♂	ad.	7.7
30.3.	Balatonfenyves	265	♀	juv.	7.1
31.3.	Klingenbach	324	♂	juv.	7.0
1.4.	Marcali	307	♂	juv.	6.9
3.4.	Buzsak	295	♂	juv.	7.3
4.4.	Balatonfenyves	365	♀	ad.	7.1
6.4.	Vasvar	310	♂	juv.	7.0
6.4.	Vasvar	270	♂	juv.	7.4

Fall migration: First woodcock arrived extraordinarily early by September 20, and migration continued over a long period. Due to a cold spell in the beginning of November with Northern winds the birds disappeared from higher elevations, but many stayed in the valleys, where some even spent the whole winter, which was very mild. Only once (mid-November) snow cover reached lower than 600 mNN. Some woodcock even dwelled in maize-fields until they were harvested. Probably due to the long duration, there was no pronounced peak of migration this fall.

Date	Location	Weight (gr.)	Sex	Age	Bill length 8cm)
13.10.	Reinischkogel	365	♀	juv.	6.9
15.10.	Gasselsdorf	347	♂	juv.	7.0
16.10.	Reinischkogel	310	♂	juv.	6.8
27.10.	Grambach, Grieb	328	♂	juv.	6.8
1.11.	Gasselsdorf	393	♀	ad.	7.6
11.11.	Rosenkogel	346	♂	juv.	7.1
14.11.	Stadl/Raab	356	♀	juv.	7.2

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BRITAIN and IRELAND

Woodcock Production Survey 1987/88

John Harradine

Introduction

The 1987/88 season was the thirteenth in which the ages of woodcock from the game shooting bag in the UK and Ireland have been monitored. Over the years patterns have emerged in the wintering distribution of young and adult woodcock in this country as revealed by this survey. In particular, the southwest of England, especially Cornwall, has regularly shown a higher proportion of young woodcock in the bag than elsewhere. Increasingly, though, it seems that this is due, at least in part, to the particular type of woodcock shooting which takes place in some parts of the county.

The continued success of this long-running survey depends on the support of game and rough shooters, as well as on the weather conditions of each season. The 1987/88 sample was substantially smaller than usual, no doubt as a result of the remarkably open winter and relatively few birds which contributors reported seeing and shooting.

Results

The main results for 1987/88 are summarised in the table. The total number of wings received (1465) was under half the usual sample, with the Republic of Ireland contributing the largest number, followed by the southwest region of England, and Wales. These numbers reflect the importance for woodcock of these favourable extremities of its wintering range and hence for woodcock shooting.

The overall U.K. and Ireland age ratio, or proportion of immature birds, at 57.8% is rather above the long-term average (about 53%), suggesting that the 1987 summer was above average for nesting woodcock. Support for this conclusion comes from the Danish woodcock wing studies, which also recorded a slightly better than normal breeding season that year. Results from the second year of the newly-established woodcock wing study in the Netherlands, although based on a rather small number of wings (121), also suggest a good season- with 60.9% immature birds.

Since the numbers of wings received were so much reduced this season there is more variation than normal in the figures from region to region. Whilst the age ratios from virtually all regions of the UK and Ireland tended to be higher than average the large number of wings received from Southern Ireland, where the ratio tends to be a little lower than in Britain, may have had the effect of depressing the overall ratio to some extent.

The southwest region, though, continued to show its high proportion of young birds (70.1%) but further analysis shows again that it is really Cornwall that stands out in this respect. Its ratio was 74.5% whilst Devon, next door, returned only 54%! Again these results reinforce the view that it is the special circumstances of Cornish woodcock habitat and woodcock shooting which contribute to this effect.

Few other counties returned enough wings to provide reliable indicators of their age ratio. The samples from both Northern and Southern Ireland, though, particularly from Co. Fermanagh, Co. Donegal, Co. Kerry, and Co. Cork (323 wings alone!), all tended to show lower proportions of young woodcock than

elsewhere - a pattern often found in the past.

As before, also, the Channel Islands, in particular, Guernsey, returned the highest ratio (82.8%) although from a rather small number of wings. This pattern appears every season and appears to reflect French findings that immature woodcock generally are more abundant on offshore islands than on the mainland, probably as a result of more favourable environmental conditions but also differences in behaviour and distribution between young and older birds.

Conclusions

Wing studies of woodcock, snipe and ducks are increasing throughout Europe and Scandinavia, as people realise the value of wings in revealing aspects of quarry species' biology and behaviour which cannot easily be obtained by more traditional research studies of these birds. Indeed, the International Waterfowl and Wetlands Research Bureau's newly established Wing Survey research group, coordinated by the B.A.S.C., is holding its first meeting in the Netherlands in February 1989. This group will be concentrating on the studies of wings that have recently started in several countries, and will begin relating the results from different parts of the migratory range of these species. This is likely to show even more the value of conducting such studies to increase our understanding of the biology and behaviour and the management needs of our important migratory quarry species.

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WOODCOCK PRODUCTION SURVEY
1987/88

	%Immature	Number of Immature	Number of Adult	Number of wings received	% of wings received from each region
Scotland	62.1	36	22	58	4.1
England					
North	63.8	51	29	80	5.6
East	52.9	27	24	51	3.6
Midlands/south	60.0	42	28	70	4.9
Southwest	70.1	239	102	341	23.9
Wales	50.2	111	110	221	15.5
N. Ireland	47.4	46	51	97	6.8
S. Ireland	53.4	258	225	483	33.8
I of M	59.3	16	11	27	1.9
	57.8	826	602	1428	
CI	82.8	24	5	29	
Unknown		4	4	8	

FORAGING HABITS OF FEMALE COMMON SNIPE GALLINAGO GALLINAGO DURING INCUBATION

The ranging behaviour of ten radio-tagged female snipe breeding in lowland wet grassland in Cambridgeshire, England was studied during incubation. Feeding sites were identified by radio-tracking and the diet investigated by faecal analysis. The timing and duration of absences from the nest were established by continuous monitoring of the signal from the radio-tags.

Female snipe incubated their eggs without assistance from their mates. They left the nest for short periods (mean 15 min) during daylight and were absent from the nest for 22% of the time. The proportion of time spent away from the nest increased with increasing ambient temperature.

There were individual differences in the type of habitat used for feeding and the distance from the nest of feeding sites. Some birds fed in unflooded meadowland, usually near the nest and others moved to wetter areas at pool and ditch edges. Snipe walked from the nest to feeding sites within about 70 m and flew to more distant sites.

Snipe fed on earthworms, insect larvae and snails. The importance of earthworms in the diet was reduced in a year when their abundance in meadowland declined after prolonged summer flooding and the snipe fed at ditch edges rather than in meadowland.

Both the density of invertebrates and the force required to probe the surface soil influenced the use of feeding sites near the nest. Females fed near their nests in unflooded meadowland in areas with a moderate biomass density of soil invertebrates and surface soil that was easily probed. They fed in wetter habitats further from the nest if the invertebrate density near the nest was low or if the soil surface had dried out and was difficult to probe.

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FINLAND

Some information on woodcocks of the Åland Islands

Pál Máriássy

The Åland Islands consist of the main island of roughly 640 km² and several thousands of smaller islands and tiny islets. Almost all are inhabitat by woodcocks that normally arrive between April 5 and 10, in early springs by end of March already.
Only about 200 of the 23.000 inhabitants hunt for woodcock, the majority of the hunters is more interested in sea ducks. There is a hunting season for woodcocks from May 1 - 25, but only for roding birds. Between 100 and 200 are shot annually, and of those dissected all have been males.

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GREAT SNIPE EXTINCT IN FINLAND

According to the recent Finnish Red Data Book (Suomen Luonto 46(3)), the Great Snipe is now extinct in Finland. The suggested cause is the reclamation for agriculture of the traditional meadows where the snipe bred. In the main breeding area, the area of meadows was reduced by two-thirds between 1880 and 1910.

GH

FRANCE

Inquiry on the biology of the Common Snipe capella gallinago

The "International Club of Snipe Hunters", member of the French Delegation of the International Council for Game & Wildlife Conservation (CIC), wishes to enlarge his contacts with any similar association or indicidual personality qualified in countries concerned with snipe populations.
This Association has, as of today, numerous biological and cynegetic data concerning snipe: it would be happy to have its foreign friends beneficiate and collect in exchange the knowledge which they could themselves acquire. Interested persons should get in touch directly with:

Mr. de Mareuil
President
Association Internationale des Chasseurs de Bécassines
10 Rue de Lisbonne
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France

A similar inquiry concerning breeding distribution of the woodcock in southern Europe was initiated by Mr. J.-J. Carrier. He had presented the results during the General Assembly of the International Council for Game and Wildlife Conservation (C.I.C.) in 1988, Florence, Italy. His study revealed some interesting observations of woodcock breeding locally in the Pyrennees, Northern Italy and Turkey.

HK

ITALY

Snipe Habitat in Italy: Situation and Prospects

R. Massoli-Novelli

With the aim of analyzing the dramatic decrease in the snipe habitat in Italy, a questionnaire was sent to 50 experts. For the research, habitats were classified as natural (swamps, marshlands, grasslands) and artificial (rice paddies).

For the first group, data came from 146 questionnaires related to the same number of swamps, marshlands, grasslands existing in 24 Italian provinces, from Venice to Palermo. In 1965 the 146 wetlands extended over 32.068 ha; in 1987 they were reduced to 6.036 ha, for a decrease of 81%. The reasons were: agricultural drainage (48%); touristic developments and industries (22%); eutrophication, filling in and Phragmites (12%); too high water level, subsidence and wetland management for ducks (11%); embankments and canals in rivers and deltas (8%); waste deposits (3%); others (4%). The greatest impact (agriculture, i.e. maize and other cereals) was completely anti-economic because in 1988 an EEC agreement established that Italy must take one million hectares of cereals out of cultivation.
Considering all the impacts, the worst effects were along the coasts, while the inland wetlands suffered much less.
Further concern is given by the fact that important swamps were drained very recently (Sardinia, Puglia): the trend continues to remain negative.

The snipe bag, related to 132 natural wetlands (14 became oases during last 20 years), diminished from 8.1 in 1965

to 1.0 in 1987 (average bag for one hunter in four hours activity). Bag reduction was 88%, more than the habitat decrease, quite probably for a too high hunting pressure over the few remaining areas.

Research on the snipe habitat in Italian rice paddies gave data different in theory but similar in practice. The total area covered by rice paddies in Italy, mostly concentrated in the Piedmont and Lombardy regions, went from 160.000 ha in 1965 to 190.000 in 1987. This 19% increase brought no increase in snipes: data from 12 questionnaires from six provinces showed that the average bag went from 10.4 (1965) to 2.2 (1987), with a reduction of 79%. In fact Italy has recently reached worldwide supremacy in rice production per hectare: more than 60 qli. This means highly negative impact on snipes, caused by the continuous use of herbicides (Molinate), perfect field drainage, a high degree of mechanization with complete cutting of rice plants. Data on these impacts are given. Snipe bag statistics are seen to be reliable environmental indicators.

Negative impacts on both natural and artificial habitats are discussed and three proposals are made:
- a national census of remaining swamps, marshlands and grasslands, carried out with the participation of all the groups interested, i.e. environmentalists, hunters, farmers;
- more effective control over the use of herbicides in rice paddies;
- the immediate application in Italian snipe areas of the 1986 Agreement between farmers' and hunters' groups, to work together to make snipe habitat conservation economically viable.

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NOVARA
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MACERATA
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RIETI
L'AQUILA
ROMA
LATINA
FOGGIA
CASERTA
TARANTO
ORISTANO
CAGLIARI
CATANZARO
PALERMO
TRAPANI
ENNA
SIRACUSA
Provinces providing data on swamps/grasslands
" " " rice paddies
0
150 km

Radioactive Contamination in the woodcock Scolopax rusticola

S. Spano & C. Salvo

Introduction

Woodcock populations are object of wide hunting throughout the whole European region (about 3.700.000 bagged specimens per year, see Hepburn, 1983). The Italian populations are constituted by specimens migrating mainly from Finland and Baltic countries (Spanò 1982). These regions have been affected by nuclear fall out after the Chernobyl disaster and it is so expected that woodcocks bagged in Italy after 1986 should bear traces of radioactivity. Woodcocks, in fact, are secondary and tertiary consumers of small invertebrates inhabiting the first 5 cm of soil and accumulating radioactivity in their tissues.

Radioactivity could be a useful indicator of the location of nesting sites of Italian woodocks. Spanò & Chelini (1982), and Spanò (1988), from the analysis of thousands of wings, showed that the spatial and temporal distribution of Italian woodcocks could be influenced by age, nesting site, sex, and weather.

Material and methods

The activity of Cs137 in the pectoral muscle of 84 woodcock specimens from almost every region in Italy was measured with a gamma spectrophotometer with intrinsic Ge and Na I autocoincidence, with a resolution of 3 Kev and a sensitivity of up to 10 pCi. Three additional specimens came from Turkey (2) and Spain (1). A set of specimens was tested also for Cs 134, Ru 103, and Ru 106; the concentration of Ru was negligeable, whereas that of Cs 134 had a constant relation with the concentration of Cs 137. This last isotope was then a sufficient index to provide a general outline of the situation in the muscle. Six specimens, killed in 1984-1985, were analyzed as controls. Whenever possible sex and age were determined (23 females, 19 males, 28 youngs, 12 adults).

Results

The average activity of Cs 137 over the whole Italian territory was 74.03 Bq/kg (variance 12731.7, standard error 12.58). Regional averages are reported in table 1. Controls showed an average radioactivity of 7.77 Bq/kg. The Turkey specimens showed a radioactivity of 7.4 and 69.19 Bq/kg respectively, the Spanish one of 15.17.

No significant correlations was detected between radioactivity and age and sex.

Discussion

The national average is much lower than 600 Bq/kg, the highest allowed radioactivity in food products throughout the European Community. On the other hand radioactivity showed a ten times higher values in respect to controls (see also Manunta, 1963). Three specimens had undetectable radioactivity. Northern-central regions showed higher values than southern regions (islands included). Ligury and Tuscany showed the highest radioactivities, even though the specimens of these regions showed the highest variance of the whole sample. It is hardly acceptable that these two regions were subjected to a higher fall out than other northern Italian regions, whereas it is more probable that the woodcocks bagged there migrated from areas with different contaminations, the populations of other Italian

regions being more homogeneous. Three specimens from Ligury and Tuscany, killed on the same day (12.11.1986), showed a radioactivity higher than the allowed limit.

Radioactivity was significantly higher in October/ November than in December/January ($p<0.05$). This is probably due to the fact that autumn specimens came directly from contaminated zones, whereas winter specimens spent a sufficiently high period far from contaminated zones to metabolize radioactive substances (tab. 2).

Woodcock concentration is high in northern Italy during mid-autumn so that hunting is more active there in this period, diminishing in winter. In southern Italy woodcock hunting starts later in the year and continues up to the end of February. This difference in time of killing could explain the lower contaminations observed in southern regions in respect to northern ones. This is reinforced by the fact that some specimens killed in southern Italy during mid-autumn showed similar contaminations to specimens coming from northern Italy.

Another explanation of the different radioactivity values in northern and southern Italy could postulate that the populations of the south migrated from regions located at north-east of Chernobyl, where fall out was negligible, whereas those of the north came from regions more affected by the disaster. But this is not confirmed by the present knowledge on woodcock migration.

Acknowledgements.

The Club della Beccaccia, provided financial support. The Osservatorio per le Contaminazioni Radioattive della Fauna Selvatica of the Lega italiana per la lotta contro i tumori carried out part of the radioactivity analysis. Dr. F. Boasso helped in data collection. A warm thank to all hunters who provided the material analyzed in this study.

Literature cited

Hepburn I.R., 1983. Hunting bags and population of woodcock in Europe. Proc. 2nd Eur. Woodcock & Snipe Workshop, Fordingbridge (U.K.): 138-145.

Spanò S., 1982. Il punto sulla beccaccia. Olimpia, Firenze.

Spanò S., 1988. Nouvelles données sur la Bécasse en Italie. Proc. 3rd Eur. Woodcock & Snipe Workshop, Paris: 108-113.

Spanò S. & A. Chelini, 1983. Some results of five years study on woodcock in Italy. Proc. 2nd Eur. Woodcock & Snipe Workshop, Fordinbridge (U.K.): 127-131.

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Legend to tables

Table 1: Regional averages (X) of Cs 137 activity (expressed in Bq/kg) in woodcock pectoral muscle.

Table 2: Averages of Cs 137 activity in two groups of woodcocks during migration (October and November) and during wintering (December and January).

Table 1	n	Cs 137 ($\bar{x}$)	s.e.	variance
Liguria	11	122,47	40,7	18111.87
Piemonte	20	52,91	9,62	1807.08
Lombardia	1	24,29		
Toscana	16	128,02	48,1	37182.04
Lazio	2	3.33	3,33	13.69
Umbria	1	51,06		
Molise	2	51,80	18,13	670.81
Lucania	5	62,90	27,01	3655.23
Calabria	9	38,48	9,99	862.47
Sicilia	3	44,77	33,3	3285.6
Sardegna	7	15,54	4,07	10637.13

Table 2	n	Cs 137 ($\bar{x}$)	s.e.	variance
October/ November	45	93,61	19.98	17974.97
December/ January	31	45,88	9.99	3148.7

NORTH AFRICA

Some notes on the woodcock season 1987/88 in Morocco

Joachim A. Wadsack

During the season the lowest woodcock density was recorded since at least 10 years. The first bird was observed near Moulay-Bousselham on November 1, another one near Larache on November 8 and one more in the Marmora-Forest, November 16, 1987. There were never larger numbers of woodcock observed during this season. During average hunts of 2.8 hours by 1 to 3 hunters only 2.2 birds were flushed.
This low density of birds wintering in North Africa may mainly be due to the mild winter in Europe (see Austrian report, this issue, p. 6), where many birds could stay. In addition high precipitation in Morocco after beginning of November may have provided larger areas of suitable habitat and thus caused a wider distribution of wintering birds. Less woodcock were seen than even during the drought period in the early 1980ies.
Weights of birds shot averaged 290 gr., ranging from 230 to 325 gr.

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NORTH AMERICA

Principles of American Woodcock Management

By the U.S. Department of the Interior, Fish and Wildlife Service, the following plan for conservation and management of the woodcock was drafted in spring 1988.

INTRODUCTION

The American woodcock (Scolopax minor) is an avidly sought and highly regarded game bird in much of eastern North America. It provides considerable recreational opportunity, and therefore socioeconomic benefit. In several states it is the most important migratory game bird in terms of total harvest. The woodcock's welfare and population status have been of concern to game managers and sportsmen for decades.

Purpose

The purpose of this plan is to guide the conservation of woodcock in the United States. It describes ways in which the U.S. Fish and Wildlife Service (FWS), state conservation agencies, other public agencies, and private organizations can work cooperatively in addressing problems, developing management programs, and otherwise assuring the future well-being of woodcock.

Primarily due to habitat losses, woodcock are now less abundant than in recent decades. Populations continue to decline in some parts of North America, and recreational opportunities are being lost. Public concern over this loss has stimulated action to cope with the situation. Thus, this management plan was drafted by the U.S. Fish and Wildlife Service.

Responsibilities

The Department of the Interior has principal responsibility and authority for managing migratory birds, including woodcock. This authority was established by treaty between the United States and Great Britain (on behalf of Canada). The Convention for the Protection of Migratory Birds, has been the cornerstone of cooperative management of migratory birds since its signing in 1916. In regard to waterfowl, cooperative arrangements have functioned well because of administrative mechanisms such as advisory councils and liaison specialists. These mechanisms facilitate the exchange of views and information and foster close working relationships. For woodcock, cooperation has always existed in spirit and in more tangible forms such as survey work and periodic symposia for the exchange of ideas and information. However, effective continuous cooperation on a region-wide operational basis has been hampered by the lack of administrative mechanisms such as those that exist for waterfowl. This plan was designed to build upon existing mechanisms to promote shared cooperation and responsibility in the management of woodcock.

Maintenance

Once the plan is operational it is anticipated that cooperative management will become easier and perhaps routine. Periodic revision of the plan will be necessary as situations, priorities and strategies change. The FWS and cooperators will review and update the plan when necessary. Annual work plans will be a logical consequence of the plan. Due to the importance of Eastern Canada for breeding woodcock, the Plan will be reviewed and updated if the Canadian government wishes to join in the conservation measures outlined in this Plan.

Principles

1. Protection of woodcock populations and habitats requires cooperation and coordination of planning, research, and management activities between the individual states, flyway councils, and the United States government.

2. Maintenance and enhancement of woodcock populations is dependent on the protection, restoration, and management of habitat.

3. Woodcock populations should be managed by identifiable subpopulations where these can be biologically justified and for which management regimes are feasible.

4. Joint funding by both private and governmental organizations should be considered as an approach to financing high-priority research and management projects.

5. Managed recreational harvest of woodcock is desirable and consistent with its conservation.

6. Recreational hunting will continue to be managed under existing regulatory processes in the United States.

These principles will be subject to periodic public review to ensure they are consistent with sound management, to evaluate their environmental impacts, and to encourage public participation.

Plan Goal

The goal of this Plan is to maintain or increase woodcock populations to levels consistent with the demands of people who use and enjoy them. These populations levels would allow recreational hunting opportunities as well as benefits to the thousands of individuals interested in observing this unusual species in its preferred habitats.

POPULATIONS

Woodcock occur throughout the forested portions of eastern North America. Their range is limited in boreal Canada by the distribution of earthworm populations, their primary food item; existence of permafrost; and unsuitable forest cover. The northern limit extends from southern Newfoundland through Quebec and Ontario to eastern Manitoba. The western boundary of their range is marked by the prairie. Breeding densities of woodcock are highest in Canada and the northern tier of states immediately adjacent to the Canadian border. Woodcock breed in southern states at low densities; however the contribution, in terms of numbers of individuals, of these southern breeding areas to the continental population is unknown.

Woodcock annually migrate to southern wintering ranges located from Virginia to southeast Texas. Southward migration begins in early September in the northernmost areas. Peak concentrations occur in locations where migration is stalled by geographic or weather-related obstacles which temporarily hinder continued movement. Winter distribution of woodcock is widespread, with highest densities occurring in Louisiana.

Woodcock are managed on a regional basis. The regions are divided by the Appalachian Mountains, and are referred to as the Eastern and Central Regions (Figure 1). These units are primarily administrative devices that roughly approximate patterns of woodcock distribution. Woodcock exhibit regional differences in migration patterns and population dynamics, and are therefore referred to as subpopulations. However, individual woodcock from the Eastern Region can occur in winter within the Central Region and vice versa.

Status

FWS, in cooperation with the Canadian Wildlife Service (CWS) and many state and provincial governments, annually coordinates a survey to monitor woodcock breeding populations. This survey, known as the Singing-ground Survey, determines a population index by counting the number of singing males in the spring along randomly selected routes throughout the northern breeding range (Figure 1). The Singing-ground Survey has indicated an annual decline of 2.5% in the Eastern region since 1968, while the Central region shows no distinct long-term trend (Figure 2). This decline in the Eastern subpopulation indicates a 37.5% decrease in woodcock abundance over the past twenty years.

Use

CWS annually estimates woodcock harvest and numbers of woodcock hunters by surveying purchasers of Migratory Game Bird Hunting Permits. From this survey, CWS determines the age and sex composition of woodcock populations as well as harvest size, distribution, and hunter success. Trends in the last ten years, show that fewer Canadian hunters are pursuing woodcock and hunter success there has declined also. No trend is apparent in the age and sex composition of the Canadian harvest. In the United States, FWS monitors woodcock hunter success and the age and sex composition of the harvest by a non-random sample of veteran woodcock hunters and waterfowl hunters who also hunt woodcock. The Eastern U.S. subpopulation also shows no apparent trend in recruitment, while the Central subpopulation has experienced a significant decline in the number of young per adult female in the harvest during the past 22 years. FWS has no accurate measure of total harvest, harvest rate, or annual survival, and wing-collection data often do not agree with results of state harvest surveys. Nevertheless, both Eastern and Central Region hunters have experienced much lower success in killing woodcock during the past 20 years. A composite estimate indicates that approximately 700,000 U.S. woodcock hunters harvest approximately 2 million woodcock annually. Data from the FWS Waterfowl Harvest Survey indicate that when woodcock harvest is compared to waterfowl harvest that woodcock are at least the fifth most important species in the harvest in the Atlantic Flyway and at least the sixth most important species in the Mississippi Flyway harvest. These estimates are conservative, and it is likely that if better woodcock harvest surveys were available the relative importance of the woodcock harvest would be greater.

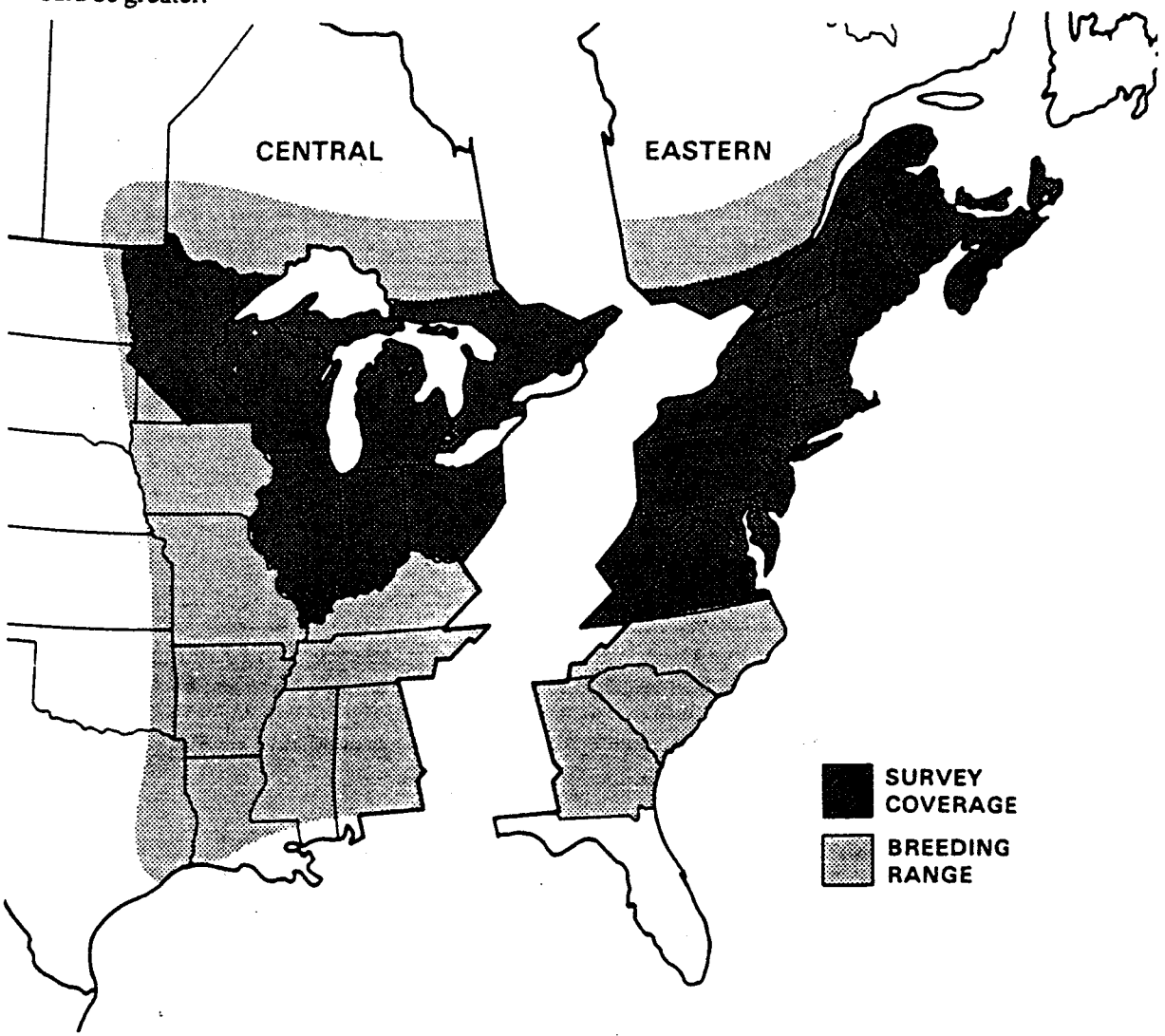

Figure 1. American Woodcock breeding range, administrative regions, and Singing-ground Survey coverage.

Woodcock hunters often join organizations such as the Ruffed Grouse Society which promotes woodcock conservation and management along with ruffed grouse conservation and management. An unknown number of Americans derive pleasure from seeing woodcock throughout the year. Male woodcock exhibit a spectacular courtship display on spring evenings at sunset. Viewing this ritual is a popular spring pastime in many areas. Park managers and naturalists can reliably schedule nature walks for park visitors during spring evenings to take advantage of these displays.

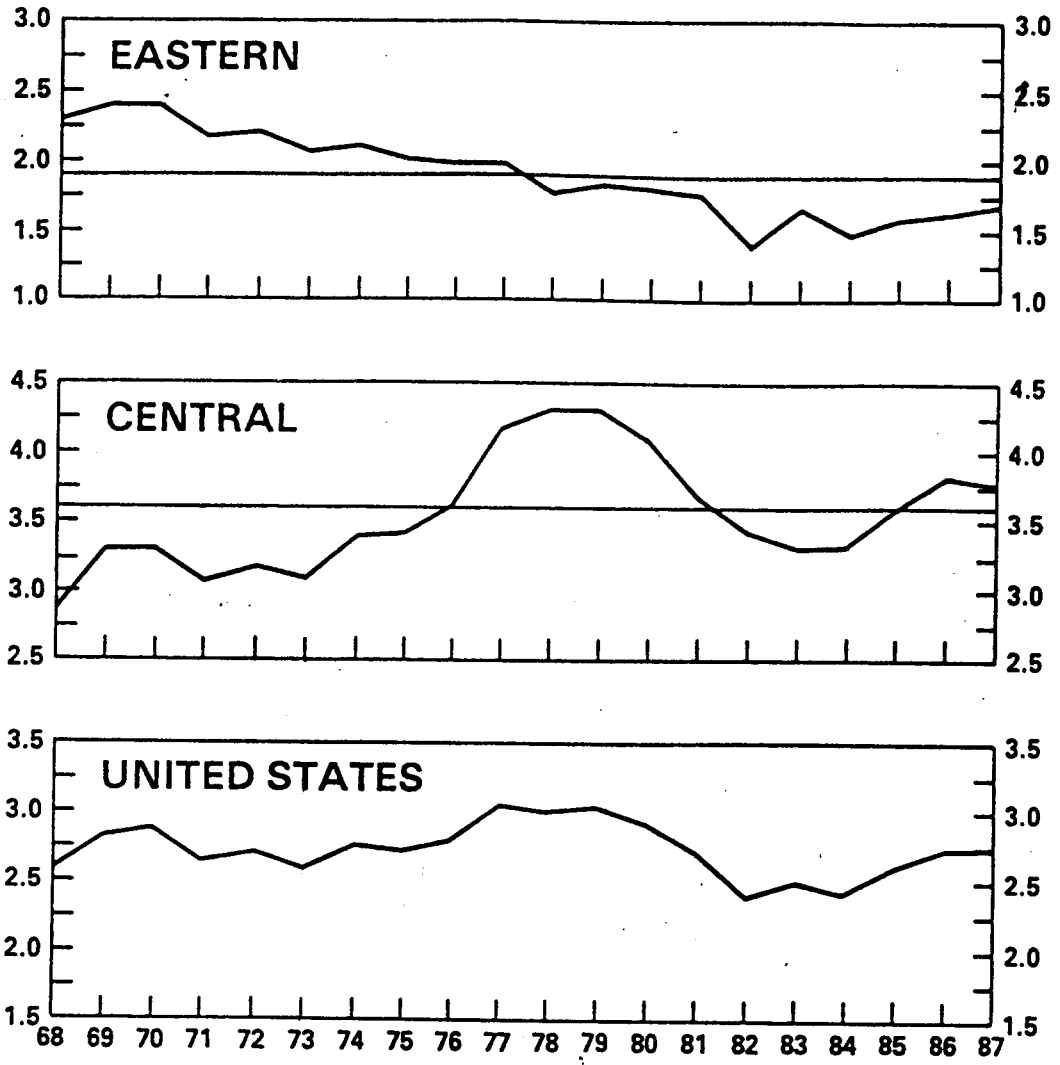

Figure 2. American Woodcock population trends as indexed by average number of singing males per route during the Singing-ground Survey, horizontal lines indicate the 1968-87 average.

Population Objectives

The overall objective of management agencies is to accommodate the diverse public interests in woodcock and to assure that all citizens who wish to do so can have the opportunity to enjoy this resource. Population levels should be maintained at or above the levels that have occurred during the random woodcock route survey period. These levels are targets for management, not upper limits.

HABITAT

The loss and degradation of habitat is the major woodcock management problem in North America. Impacts to woodcock habitat include decreases in quantity and quality due to changing agricultural and forest practices; shifting land-ownership patterns; advancing natural plant succession; and urbanization and industrialization. Scientists hypothesize a link between decreasing habitat quality from advancing forest succession and declining woodcock populations. Reversing this trend is the key to restoring woodcock populations.

Status

Breeding woodcock are dependent on early successional habitats, such as brushy fields, abandoned farmland, and small forest openings. These areas provide suitable daytime feeding locations, nesting cover, singing grounds and night roosting sites. Good woodcock habitat is widespread, but also patchy in distribution and short-lived. Land use inventories have revealed that the amount of these preferred habitats has declined with increasing urbanization, subdivision of larger parcels, and changing land management objectives and techniques. Many quality breeding habitats have been lost because they are more easily cleared and developed than mature woodland. Other habitats have been lost because of changes in land ownership. Previously, land was held for farming and timber harvesting, while it is now held as part of small residential or recreational developments. The new owners often do not have similar management goals as the previous owners, and are not interested in timber harvesting or other activities that create forest openings. Most woodcock habitat in the Northeast U.S. is owned by private citizens, with timber companies controlling the next largest proportion, and state and federal agencies holding a small percentage of the total land base.

During migration, woodcock often congregate at specific locations where weather and geography combine to cause high population densities on a temporary basis. This phenomenon is primarily due to the woodcock's habit of migrating with the passage of a weather front to take advantage of favorable winds and its inability to fly long distances. The best-known fall migration concentration areas are Cape May, New Jersey; Cape Charles, Virginia; and Canaan Valley, West Virginia. Eastern Shore of Virginia National Wildlife Refuge provides some protection to woodcock that become concentrated prior to crossing the mouth of the Chesapeake Bay at Cape Charles. The habitats at Canaan Valley, West Virginia are not protected and under increasing development pressure. The Fish and Wildlife Service is proposing to establish a national wildlife refuge at Cape May for the protection of woodcock and other migratory birds. Specific, discrete concentration areas have not been identified in the Central Region, nevertheless spring migration concentration areas may be located with further research.

While much work has been accomplished in defining woodcock breeding habitat requirements, less has been done to investigate their requirements during the winter. Woodcock are known to concentrate along the Coastal Plain in the southern Atlantic states and in bottomland habitats in Louisiana. Coastal floodplain areas consisting of bottomland hardwoods with a brush and shrub understory are known to be important, especially when in close association with agricultural fields. Many of these southern habitats have been converted to pine forests, agricultural fields or lost to other developments. The effects of forest type conversion and of the large-scale clearing of forested wetlands on woodcock population levels are unknown. There are many aspects of woodcock wintering ecology that remain unknown.

Protection and Management

Habitat management promoting early successional forest types has been shown to increase local populations of breeding woodcock and other wildlife species. Other species that benefit from this kind of habitat management include ruffed grouse, white-tailed deer, snowshoe hare, numerous passerine bird species, and many other forms of wildlife. Successful management techniques have been demonstrated on public lands in Maine, Pennsylvania, and Michigan. Private and corporate programs to manage woodlands for woodcock and other early successional species have also proven effective. Previous private and public woodcock habitat programs have been focused on individual habitats, however no large-scale initiative directed at widespread regional habitat conditions has been attempted. While it is unrealistic to expect government wildlife agencies to acquire and manage enough woodcock habitat to increase regional breeding populations, it may be possible through cooperation with various private

and corporate entities to demonstrate how large tracts of private land can be managed to favor woodcock. A high degree of cooperation and coordination between all agencies and groups will be required to achieve this desired result.

Protection of migration and wintering habitats is extremely important. Without suitable habitat in these seasons, adult woodcock and their young experience poor survival to the next breeding season. Acquisition of key migration areas may be possible due to their discrete nature. It is doubtful that adequate winter habitat can be purchased by government agencies. But agencies, private organizations, and individual citizens working together through coordinated programs can benefit woodcock by protecting habitat. Efforts to coordinate activities among these entities should have the highest priority.

There is potential for increasing woodcock habitat on lands owned by various government entities. These include lands owned, managed, or licensed by, or within the jurisdiction of, the FWS, U.S. Forest Service, Corps of Engineers, Federal Energy Regulatory Commission, Department of Defense (including Army and Navy bases), Federal Aviation Administration, and other federal, state, regional, independent, and local governmental entities.

Management Priorities

Conservation and management of woodcock habitat is the key to achieving population goals. A top priority is the implementation of a program to help commercial timber companies incorporate woodcock habitat management in their timber management activities and to inform all private landowners about potential habitat management opportunities on their lands.

Other management priorities include the protection and enhancement of key migration areas and wintering habitats. There is need to investigate the habitat requirements of woodcock in key wintering areas such as Louisiana and other Gulf coast states, and the south Atlantic Coastal Plain. Once these requirements are more clearly understood, steps should be taken to protect or otherwise conserve habitats possessing the desired qualities. Maintenance of these habitats, once they are identified, will also be important.

Habitat Objectives

We must maintain, manage, and protect habitats that will maintain or increase woodcock populations. Our objective is to achieve this within the next 15 years. Action plans within each FWS region and state, should be prepared, to include specific objectives to be achieved within the period. These plans should contain precise descriptions of actions to achieve the following:

1. Increase woodcock breeding habitat in the Northeast U.S. by improving land management practices and encouraging habitat management on private lands.

2. Protect key migration concentration areas from loss and deterioration. For example, Canaan Valley, West Virginia is currently unprotected and is threatened with loss to development projects as well as habitat deterioration, and only limited habitats at Cape Charles, Virginia are protected. Efforts to protect threatened habitats at Cape May have just begun.

3. Identify habitat requirements of woodcock wintering in southern areas, determine the availability of these habitats, and determine the need to protect key winter habitats.

4. Promote woodcock habitat management on available state and federal lands where appropriate and consistent with respective agency goals.

RECOMMENDATIONS

Habitat

General Recommendations:

- Funding for this Plan must come from all segments of the affected community, including Federal, and state governments as well as private organizations and individuals who enjoy and utilize woodcock.
- Financial incentives may be needed to induce timber companies, farmers and other landowners to manage their lands for the benefit of woodcock, whether it is breeding or wintering habitat.
- Many landowners are currently unaware of the value of their lands as woodcock habitat. Programs that inform and educate private landowners about habitat management techniques are critical to accomplishing these habitat goals.
- To preserve and maintain certain lands of extraordinary value as woodcock habitat, conservation of these lands should be assured and such lands should also be managed for the benefit of woodcock.
- Public agencies, both land-management and regulatory entities that authorize land and water uses, should be encouraged to zone, license, or otherwise regulate land and water uses to prevent the destruction or degradation of woodcock habitats.
- Public agencies that own, license, or otherwise have land-management jurisdiction should be encouraged to manage their lands to increase woodcock productivity and carrying capacity.
- Natural resource agencies should provide assistance to other agencies, private companies, and individuals in planning woodcock habitat management projects. Agencies such as the Soil Conservation Service and Cooperative Education Service should be encouraged to include woodcock habitat management guidelines in their education and extension programs.
- Public works projects and Federally-licensed development projects should avoid the destruction and degradation of woodcock habitats. However, when these actions will cause unavoidable adverse effects to woodcock habitats, adequate mitigative measures should be included in planning and development.
- Financial participation by private conservation organizations is critical to the implementation of the Plan. Land acquisition and habitat management cost-sharing and demonstration are examples of participation that may be necessary.
- Joint ventures should be encouraged as a means for governments and private organizations to cooperate in the planning, funding, and implementation of projects to preserve or enhance woodcock habitat.

Specific Recommendations

1. Both public and private organizations in the United States should be encouraged to cooperate in the planning, funding, and implementation of projects to improve woodcock habitat by promoting habitat management and preservation. These programs should include landowner educational packages, newspaper and magazine articles, video presentations, and other multi-media forums.

2. Teams of biologists and foresters from state agencies should provide technical assistance to timber and other land-holding companies and private individuals. Teams would assist in refining timber management plans for the benefit of early successional wildlife while maintaining timber production. Professional exchanges of biologists

and foresters between companies and agencies would provide company personnel with training in wildlife habitat analysis and management, and would foster improved communication between organizations.

3. Integration of wildlife habitat management techniques into timber management plans would slightly increase timber harvesting costs; however, these costs could be offset by access fees, providing landowners with tax credits for management costs, and refining silvicultural prescriptions that would allow for increased harvesting efficiency. Consulting foresters and land managers should be provided with silvicultural guidelines for woodcock habitat management. A catalog of existing state and Federal landowner incentives should be prepared.

4. Development of habitat management demonstration areas should be encouraged at all levels of government, private industry, and other appropriate forums. National and state wildlife refuges, wildlife management areas, and forests, where appropriate, should develop areas where woodcock habitat and timber management can be demonstrated. These areas will prove valuable in encouraging landowners to initiate management practices on their lands.

5. A landowner recognition program, similar to the American Tree Farm System, should be established. Programs of this type are effective in promoting wildlife and timber management on a local basis because adjacent landowners become interested in participating after observing their neighbors' land management success. The tree and wildlife "farms" also act as local demonstration areas.

6. The habitat requirements of woodcock during the winter need to be investigated. More information is needed on habitat use by wintering woodcock and on habitat management for preferred winter habitats. Research into these areas should be encouraged.

7. Protection of key staging or migration concentration areas is needed, especially at Cape May, New Jersey and Canaan Valley, West Virginia, and Cape Charles, Virginia.

8. There should be an inventory and continued monitoring of woodcock habitat in North America in cooperation with states and private conservation organizations. Understanding the relationship between woodcock populations and the amount and quality of habitat is important in adjusting habitat and population objectives. Large-scale land-use inventories can be made utilizing satellite technologies.

Population Management

General Recommendations:

- Woodcock harvests should be managed through the existing regulatory processes. Harvest regulations should be promulgated so that harvest level is commensurate with population level. Bag limits and season lengths have traditionally been stabilized for long periods of time. This should continue as long as populations are above minimum levels.

- Woodcock population monitoring should continue in the cooperative North American Woodcock Singing-ground Survey, and the woodcock wing-collection survey. Improved measures of harvest are needed. Information exchange between Canada and the United States should be continued.

Specific recommendations

1. Harvest regulations should be handled through the existing regulatory process. However, a formalized system of technical consultation with the states should be established. The Atlantic and Mississippi Flyway Councils should establish formal mechanisms to provide technical review of woodcock information and provide regulatory assistance.

2. Harvest management strategies should continue to be based on a regional subpopulation basis as long as biological information provides adequate justification for separate management objectives. If future investigation indi-

cates significant shifts in winter or migration distribution, or harvest derivation, appropriate administrative action should implemented.

3. Better estimates of total woodcock harvest are needed. A program that allows estimation of hunter numbers and total harvest annually should be developed and implemented.

4. Research on the effects of hunting mortality on woodcock populations at both local and regional levels is needed because of concerns about the impacts of harvests on declining breeding populations.

5. Breeding population surveys should be continued in the current cooperative effort. Further efforts to refine, improve, and validate the Singing-ground Survey should be continued.

6. A coordinated effort to band woodcock prior to the hunting season is needed to determine harvest rates, define harvest derivation, measure sex and age differences in survival, and evaluate effects of regulations on harvest. The cost of banding adequate preseason samples of woodcock may be prohibitive, so the cost effectiveness of normal banding, reward banding, radio telemetry, and other marking techniques must be examined, and the feasibility of such efforts determined.

IMPLEMENTATION OF THE AMERICAN WOODCOCK MANAGEMENT PLAN:

The Plan is a broad policy framework that describes the overall scope of requirements for management of woodcock in the United States. To implement this important Plan, the FWS and states should establish regional, and state plans that step-down national objectives to the operational level. These plans should include realistic cost estimates.

1. FWS Regional Woodcock Management Plans should outline recommendations for achieving national woodcock management plan objectives at the Regional level. These recommendations should delineate the agency's responsibilities and how the operational program should be conducted. Federally-coordinated programs should be identified, and detailed descriptions of on-going and future management and research directions should be included.

2. State Action Plans should further scale-down the national plans to the state level with specific programs outlined and should be the vehicle for practical implementation of general strategies. These plans require specific details of cooperative efforts and implementation schedules.

3. Joint Venture Projects should be implemented through negotiated agreements that are agreeable to all participating entities. Planning, funding, implementation and evaluation measures should be integral components of each plan or project proposal. Specific details of the responsibilities, obligations, and contributions of each agency or organization should be clearly presented. Each project proposal should be forwarded to the appropriate Flyway technical committee for its review and recommendation.

4. Initial Implementing Actions should progress according to the following schedule.

(a) The Atlantic and Mississippi Flyway Councils should establish formal mechanisms to provide woodcock technical and regulatory assistance by September 1988.

(b) States should establish teams of biologists and foresters to assist landowners in habitat management planning during 1988. States should develop action plans implementing this Plan by the end of 1989.

(c) Joint venture action groups should be established to pursue individual projects, and these groups should be established when the need for a specific project is identified by the respective Flyway Council.

(d) FWS Regional Plans should be developed by Spring 1989, and implemented by the end of 1989.

USSR

Information on woodcock bags in the USSR

Thanks to Dr. P. Majewski, Poland, and Dr. P. Blums, Latvian SSR, who translated relevant publications for us, we got the following information:

Bird game bag was analyzed by Sapetina & Priklonski (Changes in game-bird bag in the USSR during periods of 1960 - 67 and 1970 - 75. In: The ecology and conservation of game-birds, 1980, Moscow, 160 pp.) of an area representing more than 90% of the USSR. In the 1960ies annual bags of woodcock averaged 1,16 millions and in the 1970ies 1,37 millions.

In 1984 there was a spring hunting season for woodcock in 44 of the 71 districts and autonomous republics of the Russian Soviet Federative Socialist Republic (RSFSR, comprising almost all woodcock range in the USSR). Alltogether 71.000 woodcock have been bagged during this spring season. 11.000 of them were recorded from the district of Moscow, 8.600 from Leningrad, 8.600 from the Gorki, 5.600 from Jaroslav, 5.300 from Kalinin, 4.500 from Novograd, 4.500 from Kaluz, 3.100 from Kostrom, 2.500 from Vladimir and 2.400 from Pskov (Sicko, A., 1985: To use rationally game resources in spring. Ochota i ochotniče chozjajstvo 12: 4-5).

Hunting season is usually set for only 10 days in April, starting at the arrival of woodcock at the breeding areas. Thus, the timing of the season varies with the latitude of the district, starting earlier in the south and later in the north. Only hunting roding birds in the evening is permitted in spring, while in fall (mainly September) hunting with dogs is also practised (Vissiachev, pers. comm.).

HK

RECENT PUBLICATIONS ON WOODCOCK AND SNIPE (by G.H.)

ANONBY, J. E. (1986). (Woodcock displaying on the ground.) Var Fuglefauna 9:100.

Describes ground displays performed by three woodcock at dusk on 27/4/85. The birds stepped round each other, displaying and bowing continuously and making 'pist-pist' sounds but not croaking.

ARANGO, G. (1986). (Distribution of the genus Gallinago in the Andes of Columbia.). Caldasia 15:619-706. In Spanish.

BARRAILLER, J-L. (1987). (Autumn roding of the Woodcock Scolopax rusticola at Villiers-Adan, Val-d'Oise, France in 1984). Alauda 55:30-34.

In the mild autumn of 1984, croaking birds were noted on 9 dates between 1 November and 20 December 20 km north of Paris.

BYWATER, J. & McKEAN, J. L. (1987). A record of Latham's Snipe Gallinago hardwickii in Northern Territory. Austr. Birdwatcher 12:65.

Gives weights and measurements of a bird found dead on 28 August - the first record for the Northern Territory. Food remains in the stomach consisted of insects including Odonate larvae.

COLLINS, B.T. (1987). Analysis of trends from woodcock singing ground surveys 1969-1985.
Can. Wildl. Serv. Prog. Notes 170:5 pp.
(CWS, Ottawa, ON K1A OH3, Canada)

DYRC, A. & WITOWSKI, J. (1988). Numbers, distribution and interspecific relations of breeding waders in natural Biebrza fen and adjacent reclaimed marsh. Wader Study Group Bull. 51:42-44.

The Biebrza river marshes (1000 sq. km) are the largest natural fen mire in Europe. There are 17 leks of Great Snipe with ca. 370 males making it the largest population in central and west Europe.

ENDO, K. & HIRANO, T. (1986). (The habitat and distribution of Latham's Snipe (Gallinago hardwickii) in Togendi Prefecture). Strix 5:47-52.

The distribution and habitat of Latham's Snipe in the breeding season were investigated from 1984 to 1986 in central Honshu. Snipe bred in grasslands and deforested areas in vegetation up to 30 cm high. The species is declining in this area as a result of the disappearance of suitable grassland due to cultivation and tree regeneration.

FADAT, C. (1987). (Use of Woodcock Scolopax rusticola) bag statistics for the management of hunted populations.) Gibier Faune Sauvage 4:209-239. In French with English summary.

An analysis of trends in density, age and sex ratios in woodcock bags in France since 1976/77. Concludes that frequently inter-regional variation in these parameters is influenced more by such factors as weather, food requirements and shooting pressure than the demographic structure of the population prior to migration (eg. age ratio, production of young), the investigation of which is the principal aim of collecting the data in the first place! However, relative variation in bag numbers and woodcock survival is possible if age and sex ratios, densities and the number of hunters and their bags is monitored on an annual basis. Over the last 10 years, population densities have shown a steady decline of 3.3% per annum, probably due to the growing number of hunters. Mortality rates of woodcock are probably higher than those found in Britain.

FERRAND, Y. (1987). (Individual sound recognition of the roding Woodcock (Scolopax rusticola).) Gibier Faune Sauvage 4:241-254. In French with an English summary.

An attempt to solve the problem of distinguishing individual roding woodcock without the need to capture them. Sonagrams were prepared of the roding calls of eight males recorded at different times and places. Seven variables were measured from the 'twissick' component of the call. Discriminant function analysis based on three triplets of variables correctly classified seven of the birds. However, sonographic analysis showed that the calls of a radio-tagged bird recorded over a six week period exhibited considerable variation.

GRANVAL, P. (1987). (Diurnal diet of the wintering woodcock (Scolopax rusticola): a quantitative approach.) Gibier Faune Sauvage 4:125-147. In French with an English summary.

A comparison of the diurnal diet of woodcock wintering in Mediterranean and western France based on the analysis of 384 stomach contents. In both areas earthworms were the main food item forming an estimated 85% of the total energy intake. Millipedes and wireworms were very abundant in the stomachs of the Mediterranean sample but were replaced by Dermaptera and dipteran larvae in western France. The spatial distibution of birds in Finistere depended on sex. Males were more likely to be shot on hillsides and plateaux, females in valley bottoms. The diets of the txo sexes also differed but whether this is the cause or the effect of the difference in spatial distribution is unclear. Females ate more insect larvae, millipedes and earthworms than males during dry autumns and harsh winters. It is suggested that this might be a reason why females migrate earlier than males.

HOGLUND, J. (1987). Why is the lekking Great Snipe Gallinago media monomorphic and monochromatic? Fauna Norv. Ser. C., Cinclus 10:61 Abstract only.
(Dept. Zool., Univ. of Uppsala, Box 561, 75122 Uppsala, Sweden)

Suggests that male Great Snipe are selected according to characteristics other than size and plumage and that the species' previous history may also be important in explaining the lack of sexual dimorphism and diachromatism.

HOGLAND, J. (1987). Correlates of nesting success in the Great Snipe Gallinago media. Fauna Norv. Ser. C., Cinclus 10:60. Abstract only.

Male mating success is negatively correlated with the distance of the territory to the centre of the lek and positively correlated with the number of displays performed per unit time. Central males tend to be older and to be present more often in the lek. Central males also tend to have more white tail feathers than peripheral birds but this is intercorrelated with age.

HOGLUND, J. & LUNDBERG, A. (1987). Sexual selection in a monomorphic bird: correlates of mating success in the great snipe Gallinago media. Behav. Ecol. Sociobiol. 21:211-216.

KALAS, J.A. & LOFALDI, L. (1987). On the significance of good physical condition in lekking Great Snipe Gallinago media males. Fauna Norv. Ser. C. Cinclus 10:61. Abstract only.

During the early lekking period, males caught twice at the same lek were significantly heavier than those caught only once. Later in the season weights of the two categories of birds were similar. The authors suggest that being heavy is important during the establishment of the lek, but of less importance as a factor in female mate choice.

KOUBEK, P. (19886). The spring diet of the Woodcock (Scolopax rusticola). Folia Zool. Brno 35:289-298.
(Inst. Vert. Zool., Czechoslovak Acad. Sci., Brno, Czechoslovakia)

OLSSON,U. (1987). Separation of Pintail Snipe and Snipe. Brit. Birds 80:248-249.

Draws attention to the difference in the pattern of the lower scapulars for separating G. stenura (edged pale buff on both inner and outer webs) from G. gallinago (outer web with broad whitish edge inner margin rusty and narrower) on the ground.

PARNER, H. (1987). (Ringing results from Common Snipe (Gallinago gallinago marked in GDR. II. Birds of unknown origin.) Ber. Vogelwarte Hiddensee 8:20-33. In German with English summary.

PETROV, U.S. & NECHAEV. V.A. 1987. [On the breeding of the common snipe (Gallinago gallinago) in the region of the Lower Don river] Ornithologia 22:190-191. In Russian.

SILVANO, F. (1986). Common snipe Gallinago gallinago nesting in Piedmont (NW Italy). Riv. Ital. Orn. 56:267-268.

SPENCE, I. M. (1988). Mortality of Snipe estimated from a mark and recapture study. Ring. & Migr. 9:27-31.

Recovery and recapture data from 998 ringed snipe were used to calculate annual survival rates by the Jolly-Seber method. Annual survival rate was estimated to be 62.5% , which is higher than previous published estimates.