

8th Woodcock & Snipe Workshop

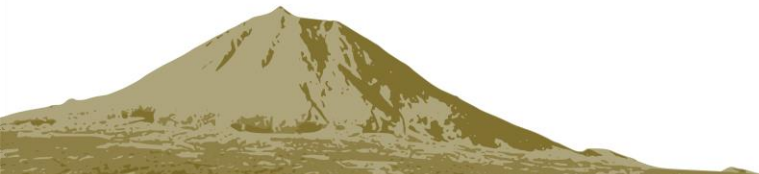
Madalena, Pico Island

(Azores, Portugal)

9-11 May 2017



Programme and abstracts



WSSG WORKSHOP 2017 - Madalena, Pico, Azores, Portugal

The Woodcock and Snipe Workshop is a regular meeting organized by the Woodcock and Snipe Specialist Group (WSSG). The WSSG is a network of specialists (scientists and non-scientists) concerned with the study, monitoring, management and conservation of populations of woodcock and snipe species. The WSSG is a specialist group from Wetlands International (www.wetlands.org), providing information and advice to support its conservation programs and projects (www.wetlands.org/our-network/specialist-groups/woodcock-and-snipe-specialist-group). The WSSG also acts as an expert group for the Species Survival Commission (SSC) of the International Union for Conservation of Nature (IUCN) (www.iucn.org/ssc-groups/birds).

The main purpose of the WSSG is to provide up-to-date knowledge on woodcock and snipe species in the world. It is also expected to encourage new research and to facilitate contacts between researchers. WSSG intends to play the role of an expertise platform for biologists, conservationists and wildlife managers interested in woodcocks and snipes for sharing and exchange of information. As these are game species, the final objective is to ensure the sustainable use of their populations.

The Woodcock and Snipe Workshop aims to share knowledge on all aspects of every woodcock and snipe species: biology, habitats, population dynamics, census techniques, monitoring, hunting statistics, management & conservation, capture techniques. The 2017 edition, the 8th Woodcock and Snipe Workshop, will be held in the village of Madalena, Pico island (Azores, Portugal) from 9 to 11 May (organized by CIBIO/InBIO, Centro de Investigação em Biodiversidade e Recursos Genéticos, and ONCFS, Office national de la chasse et de la faune sauvage).

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Edward H. Miller (MUN, Canada)
Kévin Le Rest (ONCFS, France)
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WORKSHOP LOCATION

Auditório Municipal da Madalena
Rua Dr. Urbano Prudêncio da Silva
Madalena, Pico Island, Azores

SPONSORS & PARTNERS

The organization wishes to thank the support provided by the following institutions:

Office national de la chasse et de la faune sauvage

Câmara Municipal da Madalena

Fundação para a Ciência e a Tecnologia

Secretaria Regional da Agricultura e Florestas, Direção Regional dos Recursos Florestais

Secretaria Regional do Mar, Ciência e Tecnologia

Associação Comercial e Industrial do Pico

ALFAGENE, Novas Tecnologias das Ciências da Vida, Lda.

Printing: Greca Artes Gráficas

Legal Deposit: 425864/17

ISBN: 978-989-99518-7-7

Number of prints: 60

May 2017

Recommended citation:

Gonçalves D & Ferrand Y (Eds) 2017. Programme and abstracts of the 8th Woodcock and Snipe Workshop. 9-11 May 2017, Madalena, Pico, Azores, Portugal. CIBIO/InBIO and ONCFS.

PROGRAMME

Tuesday, 9th May

AUDITÓRIO MUNICIPAL DA MADALENA		
09.00-10.00	Opening session	
10.00-10.20	Coffee	
	Natural History	
10.20-10.40	C1 - The Origins of Snipe (<i>Gallinago</i> sp.) in the Azores - Tiago M. Rodrigues et al. (abstract: page 1)	
10.40-11.00	C2 - Evolution of the Azorean populations of Eurasian Woodcock - Pedro Andrade et al. (abstract: page 2)	
11.00-11.20	C3 - Morphological divergence between the Common Snipe and the Wilson's Snipe - Tiago M. Rodrigues et al. (abstract: page 3)	
11.20-11.40	C4 - Using GPS loggers to study the breeding display of the Eurasian Woodcock - Christopher J. Heward et al. (abstract: page 4)	
	Migration	
11.40-12.00	C5 - Migrations of the Eurasian Woodcock ringed by the Moscow Woodcock Group in 1993-2016 - Sergey Fokin and Petr Zverev (abstract: page 5)	
HOTEL CARAVELAS		
12.30-14.00	Lunch	
AUDITÓRIO MUNICIPAL DA MADALENA		
14.00-14.20	C6 - Migration and movements of Eurasian Woodcock wintering in Italy: results of a five-year project based on satellite tracking - Alessandro Tedeschi et al. (abstract: page 6)	
14.20-14.40	C7 - Migration timing and strategy of the Eurasian Woodcock - Andrew Hoodless et al. (abstract: page 7)	
14.40-15.00	C8 - Effect of weather conditions on spring migration of Eurasian Woodcock and carry-over effects on breeding - Kévin Le Rest et al. (abstract: page 8)	
	Monitoring/Management	
15.00-15.20	C9 - Sex and age composition of the Eurasian Woodcock bag in Denmark - Thomas K. Christensen et al. (abstract: page 9)	
15.20-15.40	Refreshment break	
15.40-16.00	C10 - Using stable isotope analyses to assess the impact of hunting on the breeding population of Common Snipe in Denmark - Thomas K. Christensen (abstract: page 10)	
16.00-16.20	C11 - Monitoring of the Eurasian Woodcock population in European Russia (1996-2016) - Yuri Yu. Blokhin and Sergei Yu. Fokin (abstract: page 11)	
16.20-16.40	C12 - Roding censuses and population estimates of breeding Eurasian Woodcock in Belarus - Edward Mongin (abstract: page 12)	
16.40-17.00	C13 - Latest results of the Eurasian Woodcock monitoring in Hungary - Gergely Schally and László Szemethy (abstract: page 13)	
17:00-18.00	Poster session	
CELLA BAR RESTAURANT*		
20.00	Welcome reception	

Chair: Yves Ferrand

Chair: David Gonçalves

Chair: Andrew Hoodless

*Elected building of the year 2016 (Hospitality architecture category) by ArchDaily

Wednesday, 10th May

AUDITÓRIO MUNICIPAL DA MADALENA		
09.00-09.20	C14 - Changes in forest environments in Russia from the 1980s to the 2010s: consequences for the Eurasian Woodcock - François Gossmann et al. (abstract: page 14)	Chair: Yves Ferrand
09.20-10.00	C15 - Harvest estimate of Eurasian Woodcock in Italy - Michele Sorrenti and Daniel Tramontana (abstract: page 15)	
10.00-10.20	C 16 - Survey of wintering Eurasian Woodcock in Western Europe - David Gonçalves et al. (abstract: page 16)	
10.20-10.40	C17 - The breeding population of the Common Snipe in the Russian plain in the early 21st century - Yuri Yu. Blokhin (abstract: page 17)	
10.40-11.00	Coffee break	
11.00-11.20	C18 - Common and Jack Snipe project: analysis of migration, mean hunting bags and habitat use from collection of bag booklets - Daniel Tramontana and Michele Sorrenti (abstract: page 18)	Chair: D. G.
11.20-11.40	C19 - Trends of numbers and current threats for the breeding population of the Great Snipe in Belarus - Edward Mongin and Elena Davidyonok (abstract: page 19)	
11.40-12.30	Closing session	
HOTEL CARAVELAS		
12.30	Lunch	
FIELD TRIP, PICO ISLAND		
14.30	Guided tour around the island including visits to the landscape and interpretation centre of Pico Island's vineyard culture, the whaling industry museum and natural sites [#]	
20.00	Optional; depending on weather: fix point observation of <i>Scolopax rusticola</i> (roding) and <i>Gallinago gallinago</i> (drumming)	

[#]Meal bags will be handed out during the afternoon.

Thursday, 11th May

FIELD TRIP, FAIAL ISLAND		
08.15-08.45	Ferry trip to Horta	
08.45-13.00	Guided tour around the island including the visit of Capelinhos volcano interpretation centre and natural sites	
13.00	Return to Horta. Lunch and afternoon are free [§]	
PARISIANA RESTAURANT		
20.00	Closing dinner	

[§]Return ferry trip to Madalena is scheduled at 17.15.

List of poster presentations:

- P1 - Monitoring of the Common Snipe breeding population in the Azores (2014–2017) -**
Tiago Rodrigues et al. (abstract: page 20)
- P2 - Breeding habitats of Eurasian Woodcock in Russia according the data base of
Moscow woodcock group -** Sergey Fokin and Natalia Fokina (abstract: page 21)
- P3 - Annual survival probabilities of Eurasian Woodcock in North-West Russia based
on ring recovery data -** Vadim Vysotskiy (abstract: page 22)
- P4 - Eurasian Woodcock roding survey in the Azores-** David Gonçalves et al. (abstract:
page 23)
- P5 - Eurasian Woodcock ringing data report in Hungary -** Gergely Schally and Dénes Fluck
(abstract: page 24)
- P6 - The impact of catastrophic forest fires and subsequent succession of vegetation on
Common Snipe in Balahninsky lowland (Russia) -** Vladimir Melnikov (abstract: page
25)
- P7 - The Great Snipe and its conservation in Estonia -** Leho Luigujõe (abstract: page 26)

ABSTRACTS

C1 (oral presentation)

The Origins of Snipe (*Gallinago sp.*) in the Azores

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The presence of snipe in the Azores was first noticed in mid XIXth century, and for over 100 years thought to belong to the Palearctic species, the Common Snipe (*Gallinago gallinago*). By the end of the XXth century, the Wilson's Snipe (*G. delicata*), its sister species from the Nearctic, was also found to occur in the archipelago. Due to the morphological similarities and evolutionary relatedness between them, questions about the identity of the local population of snipe were raised. We present an overview of morphologic and molecular studies we have been developing to address these questions.

We analysed snipe captured in the Azores, other Palearctic regions and the Nearctic during wintering and breeding seasons. Regarding morphology, discriminant function analyses on the depth of the white tips of the secondaries and the length and width of the outer rectrix confirmed the occurrence of two distinct phenotypes of snipe in the archipelago, corresponding to the Common Snipe and Wilson's Snipe, but the latter was restricted to the wintering season. These analyses were unable to discriminate between the snipe that nest in the Azores and the Common Snipe from other Palearctic regions, suggesting that the local birds likely belong to the Palearctic species. Despite this, local birds have smaller bodies and relatively shorter tails, which suggest a certain degree of differentiation.

Genetic analysis of 16 microsatellite loci revealed that birds group into three clusters that roughly correspond to the Wilson's Snipe, the Common Snipe (from other Palearctic regions) and the local birds. This agrees with the discriminant analyses on morphological data, since the birds captured in Azores that were assigned to the Wilson's Snipe cluster were restricted to the winter sample. Also in winter sample, there is a great increase in the proportion of individuals that belong to the main Palearctic cluster, supporting the arrival of birds from other Palearctic regions to the archipelago during that season.

Both morphology and genetics support a Palearctic origin of the Azorean population. We need to develop other analysis to quantify levels of gene flow between Azorean and other populations of snipe.

Keywords: *Gallinago gallinago*, *Gallinago delicata*, Azores, Morphology

C2 (oral presentation)

Evolution of the Azorean populations of Eurasian Woodcock

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The Eurasian Woodcock (*Scolopax rusticola*) is a migratory species across most of its range, but resident populations are found in some areas like in the Azorean islands, where it constitutes an important game species. Despite this, information on the ecology and evolution of these island populations is scarce. Previous inquiries into the evolutionary relationships of these insular populations indicate that it is closely related to continental European populations, suggesting a recent colonization of the archipelago. To further characterize the woodcock populations from the Azores, we conducted morphological (external and skeletal measurements) and genetic analyses (microsatellite markers), comparing them with mainland populations.

Analyses of external morphological characters indicate that Azorean birds have shorter wings, a typical feature of insular bird populations. An extended analysis using a large number of wing skeletal samples points to a reduction in the size of the flight apparatus of Azorean populations (shorter wing bones). These results suggest that selection promoting longer wings (and thus better flight efficiency) has been relaxed in sedentary woodcock populations. Data from microsatellites indicate that Azorean populations are characterized by lower levels of genetic diversity (lower expected heterozygosity, allelic richness and Shannon index) when compared to continental woodcock. Principal coordinate analysis and genotypic differentiation tests indicate low but detectable differentiation between continental and Azorean populations (and, to a lesser extent, between populations from different islands). These results give support to previous analyses using mitochondrial and nuclear markers, providing a preliminary indication that while colonization of the Azores may be recent, current gene flow is probably restricted and morphological differentiation has occurred in line with some of the predictions of insular biogeography.

Keywords: *Scolopa rusticola*; Azores; island syndrome

C3 (oral presentation)

Morphological divergence between the Common Snipe and the Wilson's Snipe

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The genus *Gallinago* comprises 17 species that are morphologically very similar, with differences limited to body size, number and shape of rectrices, and in the way these feathers are used in display. In this study we investigate the phenotypic differences between the Common Snipe (*G. gallinago*), which is distributed across the Palearctic, and the Wilson's Snipe (*G. delicata*), which replaces it across the Nearctic.

A comprehensive sampling from museum specimens of Common Snipe (n = 518) and Wilson's Snipe (n = 544) collected across these species ranges, allowed us, for the first time, to quantify differences between these taxa in skeletal and external measurements related to resource use and in signalling characters.

Despite their allopatric distribution, the Common Snipe and Wilson's Snipe are more divergent in the characters used for signalling than in those related to resource use, supporting a larger role of social selection during the divergence of these taxa.

Keywords: *Gallinago gallinago*, *Gallinago delicata*, Morphology

C4 (oral presentation)

Using GPS loggers to study the breeding display of the Eurasian Woodcock

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The roding display of the Eurasian woodcock (*Scolopax rusticola*) provides a means of assessing abundance in a species which is otherwise difficult to survey. Counts of roding males form the basis for a British breeding woodcock survey conducted in 2003 and 2013. The results of these surveys indicate a national decline of 29% in ten years and a British population estimate of approximately 55,241 males. Yet, despite the integral role it plays in these surveys, the roding display is still relatively poorly understood.

During spring 2015 and 2016, we fitted GPS loggers to male woodcock at three woodland sites in Nottinghamshire, UK. These tags record the movements of individuals during the roding period, at one-minute intervals, for up to six consecutive evenings. The movements of these tagged woodcock are described, with particular focus on the start time and duration of roding bouts. We quantify the effects of time of year, region, local density and weather on the daily timing of the roding display using national breeding woodcock survey data. The implications for the design of future roding surveys and the interpretation of existing national survey data are considered.

Keywords: census method, GPS tag, national survey, roding, *Scolopax rusticola*

C5 (oral presentation)

Migrations of the Eurasian Woodcock ringed by the Moscow Woodcock Group in 1993-2016

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A total of 2,123 Eurasian Woodcock (*Scolopax rusticola*) ring recoveries, 826 ringed in Russia (since 1928) and 1,297 ringed in other countries are available in the database of the Russian Ringing Center.

The "Woodcock" Moscow scientific group has been working according agreements with *Office national de la chasse et de la faune sauvage* during 23 years. For this period, 3,205 woodcocks were ringed and 308 recoveries were received. 75 recoveries were from Russia, including 62 in spring on roding (45 in April and 17 in May). 38 were from the places of ringing or nearby. 14 recoveries were got in autumn (5 in September, 5 in October and 4 in November) and from them, 13 at ringing sites: 6 in the same autumn, 4 after one year, 2 after 2 years and 1 after 3 years.

The other recoveries (233) have been received from foreign countries: France - 130; Italy - 37; Spain and Greece - 14 each; Great Britain - 10; Croatia- 6; Turkey - 5; Hungary and Abkhazia - 3 each, Ireland - 2, Albania, Bosnia-Herzegovina, Bulgaria, Montenegro, Denmark, Portugal, Norway, Germany and Belarus – 1 each.

Ringing of chicks also has confirmed high philopatry and ability to breed already in the first spring after hatching year. For all the years of cooperation, our group, together with the French experts, ringed a total of 68 chicks, from which we got 10 recoveries: 3 from Russia (in ringing sites), and 7 from other countries (France - 5, Great Britain and Italy).

The analysis of all data shows that woodcocks that nest in Russia winter or migrate through 37 countries, are also hunted in many of them. Average life expectancy of ringed woodcocks is 515 days. 26 birds (1.2 %) lived for more than 7 years. The average distance of migration was 2,513 km. Five woodcocks flew over 5,000 km; four of them have made direct migration.

Key words: *Scolopax rusticola*, ring recoveries, database, migration

C6 (oral presentation)

Migration and movements of Eurasian Woodcock wintering in Italy: results of a five-year project based on satellite tracking

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From 2011 to 2015, we used satellite tracking (PTT Argos devices) to assess breeding areas, migration phenology and fidelity to wintering and breeding sites of Eurasian woodcocks (*Scolopax rusticola*) wintering in Italy.

This study has allowed to precise migratory flyways, duration of migratory movements, dates of departure, and fidelity of some birds to their wintering and breeding sites, also in relation to sex and age. The duration of transmission exceeded one year in some cases and a four migration cycle was monitored. The dates of pre-nuptial migration departures were all included within the period first decade of March until the second decade of April (n = 17). On average, the distance travelled was 3,658.3 km and prenuptial migration duration was 43 days. We obtained data about fidelity to the wintering and breeding grounds. For the individuals followed for more than one winter, the next wintering site was relocated within 20 km of their first one, and for the individuals followed for more than one breeding season the next breeding site was relocated within 20 km of their first one. Italian-wintering woodcocks were found to originate from a flyway reaching Southern Siberia; the breeding area spanned 47°40'36" N – 14°44'58" E and 59°00'59" N – 101°22'53" E. We call for international collaboration to better study these and other aspects of woodcock ecology for the good management and conservation of woodcock population, both at EU and Palearctic level.

Keywords: *Scolopax rusticola*, migration, satellite tracking, breeding, wintering

C7 (oral presentation)

Migration timing and strategy of the Eurasian Woodcock

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We outline insights gained from deploying geolocators and satellite tags to determine the migration strategy of the Eurasian Woodcock (*Scolopax rusticola*). About 96% of the European population breeds in Scandinavia, Finland, the Baltic States and Russia, but in winter the population is concentrated principally in Britain, Ireland, France, Spain, Italy and Greece. An understanding of migration routes, stop-over sites and timings is important because the woodcock is hunted across its winter range and in most central European countries during autumn migration.

Our aims were to determine the timing of migration, duration of flight stages and breeding locations of woodcock wintering in Britain, Ireland and France. We fitted woodcock with geolocators (1.5 g BAS and 0.65 g Migrate Technology, both with 20 mm light stalk) in Cornwall and Wales and with satellite tags (9.5 g Microwave Telemetry) at six locations across Britain and Ireland and four locations in France. Geolocators were used to estimate migration timing, the length of stage flights and stop-over durations, and satellite tags were used to estimate flight speed, stop-over duration and flight routes.

The timing of spring departure was influenced by temperature, being delayed in colder springs. Woodcock migration consists of a series of long, fast flights averaging 735 km (range 158-2,472 km), broken up by stops en route typically lasting 3-12 days (range 1-37 days). Average flight speed was 70 km/h (range 23-140 km/h). Four of 83 birds flew distances of 6,180-7,100 km to breeding sites in central Siberia (91°E), a previously unrecognised breeding area for woodcock wintering in Britain and France. Durations of complete migrations to breeding sites ranged from three weeks (northern Norway) to eight weeks (central Russia).

None of the newer technologies are perfectly suited to tracking woodcock, since all rely on the tag being exposed to sunlight, either for the estimation of location (geolocators) or for recharging batteries (satellite and GPS tags). The behaviour and habitats used by woodcock make this an issue affecting the quality of data returned. However, the combination of techniques to address clearly defined questions can produce great advances in knowledge.

Keywords: *Scolopax rusticola*, Argos data, breeding location, geocator, satellite tag, stopover duration

C8 (oral presentation)

Effect of weather conditions on spring migration of Eurasian Woodcock and carry-over effects on breeding

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Bird migration corresponds to critical periods in birds' fitness and the development of tracking technologies allows investigation of aspects of migration on population dynamics. The Eurasian Woodcock (*Scolopax rusticola*) is widely hunted in Europe, with likely more than 2.5 million individuals shot per year. Understanding the mechanisms driving its population dynamics is critical to ensure sustainable population management. Between March and May, woodcock migrate from south-west to north-east Europe over thousands of kilometres. This period is expected to be important for upcoming breeding because it determines the timing of arrivals and the level of energetic reserves available when reaching the breeding grounds.

From 2012 to 2016 winters, 83 woodcock were fitted with Argos satellite tags in Western Europe (59 in United-Kingdom and 24 in France). During the spring migration period, we studied the effect of weather conditions on the probability of continuing migration, at the individual level by using generalized linear mixed models. Then we investigate its repercussions on arrival dates at the breeding ground and on several breeding success indexes, e.g., ratio juveniles/adults and the percentage of early brood in autumn, available from ringing programs.

Results suggested that wind is the main variable driving spring migration decision of woodcock, with tailed winds greatly increasing the probability of continued migration. High temperatures and atmospheric pressures also reduced stop-overs times. Conversely overcast sky diminished migration activity, delaying arrival at breeding grounds.

These results reveal that the weather conditions during spring migration affect the timing of arrival, which in turn may affect breeding success. However, no significant variation in breeding success indexes was found according to weather conditions incurred during migration. Carry-over effects of migration costs on breeding are thus likely to be weak for woodcock. The main factors affecting breeding success are more likely to occur during the breeding period itself.

Keywords: *Scolopax rusticola*, Migration, Argos satellite tag

C9 (oral presentation)

Sex and age composition of the Eurasian Woodcock bag in Denmark

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The Eurasian Woodcock (*Scolopax rusticola*) is a highly valued game bird in Western Europe from which c. 2.7 million individuals are harvested annually from an estimated population of 20-26 million birds. The population size and status remains uncertain due to the cryptic behaviour and the widespread distribution on breeding and wintering areas, making reliable population surveys difficult. Hunting bag records provide age ratios among bagged birds, but sex ratios remain poorly known because the species is sexually monomorphic. We used DNA analysis to determine sex ratios among 327 shot woodcocks from two hunting seasons in Denmark (1 October - 31 January, 2012/13 and 2013/14). Based on bag totals, juvenile females constituted 37%, juvenile males 27%, adult females 16% and adult males 20% of the annual woodcock bag. The female bias was related to a significant deviation from parity in the sex ratio among juvenile birds in October, although no such deviation was found at other times or among adults. Compared to limited data from other European countries, our data suggest that autumn migration of woodcock involves an initial wave of juvenile females followed by juvenile males and adults, and perhaps that males stay further north in Europe than females during autumn and winter. This migratory pattern would suggest that postponing the opening of the hunting season could reduce the hunting bag on reproductively valuable females in this polygamous species.

Keywords: *Scolopax rusticola*, age ratio, sex ratio, hunting bag.

C10 (oral presentation)

Using stable isotope analyses to assess the impact of hunting on the breeding population of Common Snipe in Denmark

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Denmark holds a breeding population of Common Snipe (*Gallinago gallinago*) that has declined markedly since the 1970s and the most recent estimate, in 2011, was 1,300 pairs. This decline has led to a change in the national red-list status from “least concern” to “vulnerable”. As an ongoing Atlas inventory (2014-2017) predicts a continuous decline, it has become relevant to assess the impact of hunting on the Danish population from a conservation and management perspective.

The annual hunting bag in Denmark comprises on average 11,000 birds (2010-2014, out of a rough estimate of 1.8 million birds that pass through Denmark during the autumn migration from northern Scandinavia and north-west Russia, of which 1 million are assumed to stage for shorter or longer periods or undertake feather molt in Danish wetlands). With hydrogen ($\delta^2\text{H}$) isotope ratios in snipe feathers reflecting a north-east/south-west precipitation gradient and nitrogen ($\delta^{15}\text{N}$) reflecting anthropogenic agricultural activity (fertilizers and livestock manure), the origin of snipe bagged by hunters in Denmark was approximated from isotope ratios in juvenile feathers. The results showed that for the values of isotope ratios expected in Danish snipe ($-83\text{‰} < \delta^2\text{H} < -89\text{‰}$ and $\delta^{15}\text{N} > 8\text{‰}$), only 1 (~1%) bird out of 97 showed an isotope signature complying with these criteria. Relaxing the isotope range ($-70\text{‰} < \delta^2\text{H} < -100\text{‰}$ and $\delta^{15}\text{N} > 7\text{‰}$) resulted in 9 (9.3%) birds assigned as potential Danish birds. Based on known age-ratios in the hunting bag, these figures translate into 28 (1.1%) adults and 85 (3.0%) juvenile Danish snipe being bagged from a total autumn population of 2,600 adults and 2,860 juvenile birds, respectively. For the relaxed isotope criteria, the corresponding figures are 355 (9.8%) adults and 765 (26.8%) juvenile birds. The overall results show that the majority of snipe bagged in Denmark originate from areas north/north-east of Denmark and areas less affected by agricultural activities than seen in Denmark. That relatively few Danish breeding birds are affected by local hunting is further corroborated by the fact that the isotope ratios expected in Danish snipe would have similar values to snipe from southern Sweden, southern Norway and northern Germany. Hence, the present results are likely to overestimate the proportion of Danish breeding snipe in the overall hunting bag.

Keywords: *Gallinago gallinago*, breeding provenance, stable isotope, hunting

C11 (oral presentation)

Monitoring of the Eurasian Woodcock population in European Russia (1996-2016)

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Autumn roding, censuses during roding and autumn migration are important components of the Eurasian Woodcock (*Scolopax rusticola*) population's monitoring in European Russia. These works were conducted by state organization "Centrokhontrol" and the Moscow group "Woodcock, at MOO ROSIP in close cooperation with the national government, hunting society organizations and the media. All the research is conducted in collaboration with ONCFS (*Office national de la chasse et de la faune sauvage*).

Since 1999 the annual Woodcock National Roding Censuses occurs on the last Saturday of May. About 3,000 questionnaires are annually distributed to the regional hunting societies. During the 18 years that have passed an important amount of information was collected. For 43 regions of the Russian Federation, 245,951 contacts with woodcocks were registered on 31,995 listening points. Throughout the years, some of the absolute maximum values of the intensity of roding, were: Kaliningrad region (oblast) - 64 contacts for one evening (1999), Karelia - 58 contacts (2015). The regions with a very intense roding (>10.0 contacts) on average were Pskov, Novgorod, Arkhangelsk, Bryansk. Weak roding (<5.0 contacts) is typical for the whole South of European Russia and for the Tula region. For European Russia the average value for the roding intensity is in the range of 6.1 (2014) – 9.8 (1999) contacts. Roding was not observed in some of the listening points (range: 1.3% (2006) - 4.2% (2012)). The results of the Woodcock National Roding Census pointed to stability on the breeding populations in European Russia.

The spring hunting bags for game birds, including Woodcock, in Russia, for the years 1996-2015, were estimated based on data from official sources. Woodcock is the most popular game bird among waders (92% of the total bag, on average). The average number of woodcocks shot per year was 151,000 on the 1990s, 148,000 in the 2000s and 212,000 in the 2010s. In autumn, for the same years, these values were 60,000, 53,000 and 50,000, respectively. Over the last 20 years the major part of the hunting bags was carried out in European Russia, and most of all birds were shot by hunters coming from the Federal Central district.

Keywords: *Scolopax rusticola*, Russia, roding censuses, hunting bags

C12 (oral presentation)

Roding censuses and population estimates of breeding Eurasian Woodcock in Belarus

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Beginning in 2005, the Institute of Zoology of the National Academy of Science of Belarus and the APB-Birdlife Belarus (NGO Akhova Ptushak Belarusi) undertook a survey of breeding Eurasian Woodcock (*Scolopax rusticola*) to: (1) develop the woodcock monitoring program in Belarus, (2) produce baseline population index for its breeding population, and (3) investigate how distribution and abundance of breeding woodcock are related to woodland habitat characteristics. The studies were financed by the *Office national de la chasse et de la faune sauvage* (ONCFS). The survey method is based on recording contacts with roding males, as developed in France (Ferrand, 1993). Counts were made at 240 listening points located in 10 squares (12x12 km) in 2005-2008. The researches were also carried out on the territory of the Krasny Bor hunting farm and Krasny Bor Wildlife Reserve in 2015. Roding males were recorded in the majority of the listening points. Average number of contacts per 2 hours was within 10-12. Population of Eurasian Woodcock for Atlas of Breeding Birds of Belarus has been recently estimated at about 500 000 'pairs', according to the data of roding censuses.

Keywords: *Scolopax rusticola*, roding, breeding population, Belarus

C13 (oral presentation)

Latest results of the Eurasian Woodcock monitoring in Hungary

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To have a better knowledge about Eurasian Woodcock (*Scolopax rusticola*) and to aid game management decisions in Hungary, a monitoring programme was initiated in spring 2009. The program continued until 2016, providing a relatively large and reliable dataset both in space and time.

The monitoring programme is based on synchronized roding surveys performed weekly (every Saturday night), 12 times during each spring. The locations of the points were chosen by the observers and they were similar from one spring to another. The observers used standardized forms to record data on the number of contacts (woodcocks seen and/or heard), and additional information (the estimated size of the visible area, the duration of the observation, weather conditions and the land cover types surrounding the observation point). Using this dataset, we were able to evaluate the trend of woodcock presence in the country during spring.

We registered 1569 observation points in total, and their annual number varied between 856 and 1069 during the study period. The count data were highly variable in space and time. As a general rule, the yearly temporal distribution of the number of contacts was unimodal with a peak in the second half of March. Overall, we have found a slight decrease in the annual success rate (number of visits with at least one woodcock detection/number of total visits to each point) and also in the annual relative abundance of woodcocks (number of contacts with woodcocks/number of visits with at least one woodcock detection at each point) from 2009 to 2016.

The high variability of the data fits the former experience of woodcock hunters, and also reflects the flexible migratory behaviour of woodcocks. Our aim is to continue and improve the monitoring of the population in order to follow its trend and to identify the main factors influencing woodcock abundance.

Keywords: *Scolopax rusticola*, migration, monitoring, roding, Hungary

C14 (oral presentation)

Changes in forest environments in Russia from the 1980s to the 2010s: consequences for the Eurasian Woodcock

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Russia, a crucial piece in the puzzle of the nesting area for the Eurasian Woodcock (*Scolopax rusticola*), has experienced significant changes in its forest cover over the last three decades: intensification of forest cuttings in the 1980s and 1990s, large-scale abandoned fields in the late 1990s and early 2000s, and forest fires in the last decade. Several million hectares were affected, resulting in vast areas of regeneration.

We conducted research addressing:

- Forest cuttings from 1985 to 1995, study of satellite scenes Spot of 1987 and 1995 in Vladimir region in mixed forest: intensification in the mid-80s.
- The abandoned fields in the late 1990s and 2000s: analysis of two scenes Spot of 1986 and 2007, Vladimir region. The proportion of land in young forest of less than 30 years, linked to both forest cuttings and agricultural decline, increased from 11.5% to 15.5%.
- Forest fires early 2010: studies in the Ivanovo region in southern taiga. Analysis of Landsat TM scenes 2009 and 2011, of Pléiade 2013, fieldwork surveys in 2013, reveal that regeneration is practically null after forest fires on sandy soils but good on clays soils.

In 2017, as in the previous two decades, forest environments in Russia seem to be particularly favourable to woodcock, with the increase in area of young woodland most favourable to nests and broods.

The mature forest massifs are, moreover, connected by these young woodlands from abandoned fields. This mesh size increases the capacity of all forest birds.

However, surfaces of open environments, especially grazed grasslands, have drastically decreased. This results in a scarcity of nocturnal habitats for preparation of post-nuptial migration.

The increase of favourable breeding habitats suggests that the number of woodcock in Russia may be maintained or even increased. In order to ensure knowledge of the evolution of the forest, it may be appropriate to define a monitoring protocol with satellite imagery or to be a partner in such a program, ideally correlated with monitoring of breeding populations.

Keywords: *Scolopax rusticola*, Russia, forest change, regeneration

C15 (oral presentation)

Harvest estimate of Eurasian Woodcock in Italy

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Migratory Bird Office of *Federazione Italiana della Caccia* is involved in managing Eurasian Woodcock (*Scolopax rusticola*), with Italian and European institutions, also in cooperation with FACE, European Hunter's Association. In such contexts harvest data are requested, and they will be mandatory for next Art. 12 of Birds Directive Report, 2014-2020. At the moment, official estimate of national hunting bag of migratory birds are not available, but administrative regions are in charge of collecting harvest statistics. Our office collects data from regions in order to analyse them. This work aims to estimate the total Italian woodcock harvest, as a mean of recent hunting seasons, and to provide trends of mean bag for some regions. We collected data from 15 regions out of 20. The data set is not uniform, as some regions sent data from many hunting seasons, while others sent just the last season results, or the previous one. We calculate a harvest mean value for regions with multiple season data and used the single data for others region. Corrective factors were used to calculate not declared birds in 15 regions from which we received data. For the five regions with no data we used the mean bag value per hunter and season of nearby regions and extended the value to the total of hunters in those regions. For four regions total declared birds are available for a season list, so we calculate trends of mean harvest per hunter. A total estimate with intervals is presented, and trends for some representative region. We expect to create an effective monitoring system for woodcock harvest, to be used in management debate.

Keywords: *Scolopax rusticola*, Italy, harvest, hunting, estimate

C16 (oral presentation)

Survey of wintering Eurasian Woodcock in Western Europe

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The Eurasian Woodcock (*Scolopax rusticola*) is a mostly migratory wader, broadly distributed in the Palearctic. In Europe it winters or migrates through all European countries, being an important game species in many of them. Sustainable management of the species requires information regularly collected regarding abundance and demographic parameters. It is a complex task given that different phases of its annual life cycle encompass different countries. Due to its secretive behaviour, Eurasian Woodcock populations cannot be properly evaluated by common bird census techniques. Hunting activity can provide data to annually evaluate abundance and demographic parameters.

We present the results of the work developed by the associations of woodcock hunters from different European countries, joined in the "Fédération des Associations Nationales des Bécassiers du Palearctique Occidental" (FANBPO, Federation of the National Associations of Woodcock Hunters from the Western Palearctic). The associations encourage their affiliates to collect data during the hunting season. The abundance of woodcock is estimated as a hunting index of abundance (ICA = number of woodcock seen per standardized hunting trip; i.e., 3.5 hours). For each bird bagged, hunters are asked to determine sex by gonad examination and to collect a wing for age determination.

Data concerning variation in woodcock abundance over several years or hunting seasons is available for France (21 years), Switzerland (17 years), Spain (11 years) and Portugal (8 years). For these countries, and for Italy, Ireland and Wales, data from bagged birds allow the evaluation of demographic parameters (percentages of young/adult and males/females).

This is an example of citizen science, developed by the associations of woodcock hunters in different European countries, that aims to maintain a favourable conservation status of the Eurasian woodcock while allowing a rational use of its populations by sustainable and controlled hunting.

Keywords: *Scolopax rusticola*, survey, winter, Western Europe

C17 (oral presentation)

The breeding population of the Common Snipe in the Russian plain in the early 21st century

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A significant part of the European breeding population of the Common Snipe (*Gallinago gallinago*) breeds in Russia. Hundreds of thousands of these birds spend the winter in Europe. The number of breeding pairs in the Russian Plain seems to be very high. This has been revealed through the scientific and technical partnership between *Office national de la chasse et de la faune sauvage* (ONCFS) and Russian Bird Conservation Union (RBCU), in the series of projects developed in the period 2003-2009. The further important step of this cooperation has become the organization of the snipe population monitoring, conducted by ONCFS and Russian Society for Conservation and Studies of Birds (Birds Russia, now MOO ROSIP), starting from 2012. These studies take place in 13 federal subjects of the Russian Federation and 8 geographical zones and subzones, from south tundra to forest-steppe.

In the breeding period, the census of snipes consisted on the count of drumming males within census sites (average surface 75 ha). The total number of census sites varied annually from 121 to 131, and their total surface from 83.3 to 100.0 km². The analysis of the census data was made for the most important habitats for snipe (bog, floodplain and meadow), at geographical zones and subzones, as well as for mire provinces. The annual values of snipe density ("drumming" males, or conditionally breeding pairs/km²) in various habitats were estimated for the five-year period.

The values of maximum snipe nesting density (pairs/km²) obtained in the course of the project were: in the forest-steppe and deciduous forest - 23.4; south taiga and mixed coniferous-broadleaved forest - 70.8 pairs/km²; middle and north taiga - 33.3; forest-tundra - 20.0; south tundra - 15.7. Herewith, in the forest zone, the maximum figures were obtained at flood-lands; in forest-tundra and tundra - outside of flood-lands. The average value of snipe density, 12.9 ± 2.0 pairs/km², was the highest ever observed at mesotrophic bogs in the south taiga and mixed coniferous-broadleaved forest subzones, in the group of mire provinces of eutrophic and oligotrophic pine-sphagnum bogs of Eastern Europe.

Keywords: *Gallinago gallinago*, Russian Plain, monitoring, census

C18 (oral presentation)

Common and Jack Snipe project: analysis of migration, mean hunting bags and habitat use from collection of bag booklets

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Migratory Bird Office of *Federazione Italiana della Caccia* started Common and Jack Snipe project in 2010. This study aims to analyse migration, hunting bags and habitat use of Common Snipe (*Gallinago gallinago*) and Jack Snipe (*Lymnocyptes minimus*) in Italy. Starting from a sample of 97 sites visited by single hunters from 2010/11 hunting season to 2015/16 hunting season, 8 sites were monitored in all six seasons. Each hunting season includes the postnuptial migration and wintering phases. In the six seasons, 26,764 Common Snipes and 3,811 Jack Snipes were counted, and 5,991 Common Snipes and 1,783 Jack Snipes were bagged. The data collected through counts and hunting bags, made with the assistance of pointing dogs, have allowed us to apprehend the abundance of birds on the sites. A chi-square test was applied to highlight the peaks of hunting bag of both species. For Common Snipe, the peak of hunting bag occurred in general in the third decade of October and the second decade of November, while the peak of hunting bag in wintering was observed in the third decade of December. For Jack Snipe, the peak of hunting bag occurred in the third decade of October and third decade of November, while the peak of hunting bag in wintering was also observed in the third decade of December. The hunting bags trends as well as censuses show a slight increase of the two species during the six hunting seasons. Concerning their habitat, Jack Snipe is bagged in a larger panel of wetlands compared with the Common Snipe, even if only slightly, with more shallow waters and rich vegetation. Common Snipe is bagged in less bushy areas, with low vegetation. We discuss the differences in the choice of habitat also in relation to a possible different anti-predator strategy of the two species.

Keywords: *Gallinago gallinago*, *Lymnocyptes minimus*, Italy, hunting bags, migration, habitat

C19 (oral presentation)

Trends of numbers and current threats for the breeding population of the Great Snipe in Belarus

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The Belarus has one of the largest breeding populations of the Great Snipe (*Gallinago media*), a species listed as Near Threatened in the IUCN Red List (2016). Based on the information we collected between 2000 and 2004, the Great Snipe was included in a previous version of the Red Data Book of Belarus (2004) as Endangered species (Category II) and currently is legally protected on the territory of Belarus. Further monitoring researches undertaken with the support of the Rufford Foundation between 2013 and 2016 allowed us to determine the recent trend of the numbers and threats for this breeding population. ANOVA of data of censuses on the same leks revealed significant reduction in the number of lekking males ($p < 0.01$). The numbers of lekking males decreased 3 to 5 times in some places due to overgrowing habitats and the deterioration of conditions for nesting. According to the TRIM program, the current trend in key breeding habitats was classified as steep decline ($p < 0.01$). Our results allowed to preserve the Great Snipe status in the new edition of the Red Data Book of Belarus (2016). Pilot restoration of the breeding habitats in the Sporovo Reserve was also performed in the framework of the project in 2013 and 2016. Restoring optimal vegetation structure in these habitats may increase the numbers of breeding birds in subsequent years and will preserve breeding habitats in the optimal structure.

Keywords: *Gallinago media*, trends, monitoring, habitat restoration, Belarus

P1 (poster presentation)

Monitoring of the Common Snipe breeding population in the Azores (2014–2017)

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The Azores harbours a resident population of Common Snipe (*Gallinago gallinago*), distributed on the islands of Corvo, Flores, Faial, São Jorge, Pico, Terceira and São Miguel, and estimated between 378 and 418 breeding pairs, according to the Portuguese breeding bird atlas, published in 2008. Despite the species being hunted on most islands, a monitoring program was lacking in the archipelago.

In 2014, the DRRF implemented a monitoring program based on point count surveys. The points were established in areas where snipe was confirmed to nest, or was known to occur during the breeding season. Each year, they are visited during April, when snipe displaying activity peaks in the archipelago. The visits take place at dawn, between 30 minutes before sunrise until 2 hours and 30 minutes after it. At each point, the observer registers and maps the behaviour of all the individuals noticed during 10 minutes of passive listening. The number of different birds detected in display (*drumming* or *calling*) per minute is used as an index of abundance. The population has been monitored in Faial (since 2016; 10 points), São Jorge (2014 only; 21 points), Pico (since 2014; 15 points), Terceira (since 2014; 21-26 points) and São Miguel (since 2014; 3-4 points).

For the islands with longer time series, the abundance of snipe seems to have remained stable along the years. On Faial and Pico, the overall abundance was always below the observed on the other islands. The counts show that the Common Snipe might be breeding in areas of Faial and São Miguel that were not accounted during the last assessment, published in 2008, suggesting that on these islands the population can be larger than previously estimated. Furthermore, on Terceira, the number of different birds seen each year surpasses the total estimated for the population. Such increase is likely a result of the different timeframe used before 2014 (between May and late June on most islands) and after (April) to assess the population.

Keywords: *Gallinago gallinago*, Azores, Monitoring, Point counts

P2 (poster presentation)

Breeding habitats of Eurasian Woodcock in Russia according the data base of Moscow woodcock group

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Study of nesting Eurasian Woodcock (*Scolopax rusticola*) in Russia has been carried out since 1993 in collaboration with the Office national de la chasse et de la faune sauvage (ONCFS).

More than 30 scientific expeditions have been organized in spring and summer, in which about 50 Russian and French experts have participated. Pointing dogs were used to search for woodcock nests and broods. A special request was made to hunters, gamekeepers and foresters to inform us of any nests found. Full geobotanical descriptions of habitats around the nests were made. In total, we have produced a database with information on 145 nests.

Most of the data was received from Ivanovo (37 nests), Vladimir (23) and Moscow (13) oblasts, where there were working expeditions and from other regions (72). Nests were found in April (20.7 %), May (51 %), June (17 %), July (8.2 %) and August (2.7 %). The earliest nest found was on 15.04.2004 in the Moscow oblast, and the latest on 06.08.2015 in the Kirov oblast.

The location from detailed habitats descriptions for 133 nests or 65.6 % were in a forest. Of these, 71 % were within 50 m from a clearing and only 29 % were in deep forest. 7 nests were found outside of a wood on its edge, 13 on cutting, 7 on a growing broken field, 4 on quarterly clearings, 4 on a glade in a wood and some in plantings : fir-trees 2, pine 3, lime 1. Atypical places of nests were: 2 on a pit bog, 2 on a meadow, one on pebble edge of a river, in a deserted garden, on a heathland at a gas main.

In woodland the majority of nests (75) were found in the mixed forest, in coniferous 17, in deciduous 24, including 6 in waterlogged areas. Among dominant trees were birch (33), fir (25), pine (19), aspen (15), alder (7), willow (6), oak (3), lime, hazel grove, bird cherry, poplar (one each).

The outcome of 57 nests is known. Females of woodcock abandon nests much more often than others waders. Nestlings only hatched from 28 nests (49 %). In 26 % of cases, females abandoned nests after first being flushed from the nest. 21 % of nests were destroyed (by foxes, martens, wild boars, dogs, a raven, mushroom pickers). 4 % were lost for other reasons (cutting woods, flooding after rain and one other).

Our database indicates that chicks hatched from May 2 until August 10. The peak of hatching falls during the period May 15 - June 10. Nestling success depends on weather during this period.

Key words: *Scolopax rusticola*, nest, hatching, habitats description

P3 (poster presentation)

Annual survival probabilities of Eurasian Woodcock in North-West Russia based on ring recovery data

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We analysed a total of 390 recoveries of Eurasian Woodcock (*Scolopax rusticola*) from 3,158 birds ringed during 1994-2015. Ring-recovery matrices were tabulated for 1994-2016/17 by each age class, using number ringed and ring recoveries. We used a Brownie parameterization of ring-recovery models in Program MARK version 8.1 to estimate annual survival and reporting rates. Two age class models are relevant in our study. This approach permitted separate estimation of first-year and adult survival and reporting rates (i.e. to test for age effects).

The global model for the ring-recovery analyses assumed that survival and recovery rates for woodcock were time-dependent and age-dependent. We constructed an a priori set of 23 candidate models from a global model with age (first-years, adults) and time-dependent annual survival and reporting rates through to no age or time-dependent survival and reporting rates (i.e. various reduced-parameter models with constant rates). We looked for a global model fitting the data for Seber's parametrization. A simulation approach was used to calculate the goodness-of-fit between our data and the global model. A distribution of expected \hat{c} for the global model was generated from 1,000 simulations. Observed \hat{c} was then compared with the distribution of simulated values to determine whether the global model was an adequate fit to the data. We calculated the variance inflation factor as the observed deviance from the global model divided by the mean deviance from 1,000 parametric bootstrap simulations of the global model. We estimated the variance inflation factor from the global model as $\hat{c}=1.196$, which was too low to be used to correct the models for overdispersion.

Goodness-of-fit tests based on 1,000 simulations indicated that the global model was a satisfactory starting point. Using Akaike's Information Criterion we chose a final additive model in which variation in reporting with time was parallel for two age classes, and survival probability was age-specific (first-years vs. adults). First-year woodcock had lower annual survival probability ($S_{\text{juv}} = 0.45$; SE = 0.024) than adults ($S_{\text{Ad}} = 0.57$; SE = 0.036). Adult woodcock had lower average reporting rate than first-years.

Keywords: *Scolopax rusticola*, annual survival probability.

P4 (poster presentation)

Eurasian Woodcock roding survey in the Azores

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The Eurasian Woodcock (*Scolopax rusticola*) is a resident game bird in the Azores archipelago (Portugal). The annual survey of the species in this insular region is based on counts of roding birds, at dusk, on several observation points, during March-April. The monitoring was implemented first on Pico Island, in 2001, and was subsequently extended to the other Azorean islands where the species breeds (only Corvo Island was not included): São Miguel (in 2003), Flores (in 2007), São Jorge (in 2010), Faial (in 2011) and Terceira (in 2012). Although the woodcock was not considered to breed on Graciosa Island, we decided to perform a roding count at an observation point there, in the Caldeira, in 2013, and the result was 14 contacts. The presence of roding birds was again confirmed in 2014, but it was not possible to repeat the survey formally, in that year and after.

Flores continues to present the higher mean level of abundance (>25 contacts/point), followed by Terceira, Pico and São Jorge (>20 contacts/point). Faial appears in a third lower level (>15 contacts/point). São Miguel (the only monitored island in which it is still not allowed to hunt the woodcock) continues to present the lowest level of abundance. Along the years, for all the islands surveyed, the abundance remained relatively stable.

Keywords: *Scolopax rusticola*, survey, roding, Azores, Portugal

P5 (poster presentation)

Eurasian Woodcock ringing data report in Hungary

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In our study we summarized the official Eurasian Woodcock ringing data of the Hungarian Bird Ringing Centre, gathered along the period 1913-2015, aiming to support basic knowledge about the birds banded and/or recovered in Hungary.

Woodcocks were caught by using the method based on specific dip nets with spot lamps which was introduced in our country in 2005. Before that, most captures occurred unintentionally, during the captures of passerines with mist nets.

In total, 326 Eurasian woodcock ringing records were registered in Hungary from 1913 to 2015, 275 of them occurred since 2005. Both the annual number of ringers and the number of ringed birds increased in the second period. Most woodcocks (captured both inland and abroad) have been recovered in a distance of 1000-1500 km from their ringing locations; there were also numerous birds within 0-500 km. Woodcocks ringed in Hungary were recovered in France (9), Italy (8), Russia (2), Slovenia (2), Belarus (1), Estonia (1), Croatia (1), Greece (1), Macedonia (1), Poland (1), and Spain (1). There were also 3 inland recoveries. The woodcocks recovered in Hungary originated from France (50), Italy (13), Russia (4), Belarus (1), Czech Republic (1), Slovakia (1), and Spain (1).

Most of the recoveries (57%) occurred within one year after ringing. The recovery rate, which is linked directly to hunting pressure, is high. However, hunting activity and reporting rate of rings vary among countries, which influence the spatial pattern of the data.

Keywords: *Scolopax rusticola*, migration, ringing, Hungary

P6 (poster presentation)

The impact of catastrophic forest fires and subsequent succession of vegetation on Common Snipe in Balakhninsky lowland (Russia)

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The Balakhninskaya lowland is a glacial outwash plain on the North of the Ivanovo region (Russia), situated between the rivers Klyazma and Luh, where the forest on the sand soil is regularly exposed to local fires. Here, are situated two large areas important for Common Snipe (*Gallinago gallinago*). In the beginning of XXI century both areas were covered by pine forests, but, in 2003, their central parts were burned. The first plot (130 ha) was a burnt forest. The second plot (80 ha) is located on the plot of pine forest with lakes, swamps and sinkholes. On the burned plot, after 2 or 3 years the dry pines began to break and fall. In July and August of 2010, Balakhninskaya lowland was again exposed to a large fire that burned both plots. Old fallen trunks and young pine trees were completely burned down to mineral (sand) layer. In 2012, the herbaceous vegetation began to appear in moist depressions. Between 2014 and 2016, grass and birch undergrowth began to develop across all places. At the forest plot, in 2012 and 2013 most of the pine trees were dried. In the second half of the summer of 2013, the pine trees began to break down. From 2014 to 2016, the process continued and the forest disappeared.

At the areas burned in 2003, the Common Snipes began to nest when areas opened after the break down of dead trees. In the beginning, Common Snipe density was higher than 10 pairs/km². In the first year after a fire, in 2010, the number has decreased significantly at both places. In subsequent years, the numbers gradually began to recover. The number of Common Snipe on the old burned forest approaches those noted before the fires. On the sites with burnt and fallen forest, the number of Common Snipe has increased significantly, reaching a density of 16 pairs/km². Thus, at the area with forest, damaged by the great fire, in the first years post-fire succession good conditions were created for the Common Snipes. The increasing of openness (loss of dead trees) is causing a snipe population increase. The further course of succession, apparently, will lead to the decline of the species.

Keywords: *Gallinago gallinago*, landscape dynamics, wildfires, ecological succession.

P7 (poster presentation)

The Great Snipe and its conservation in Estonia

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This presentation is based on the Estonian national management plan for the Great Snipe (*Gallinago media*), since 2002. The Great Snipe is classified in the IUCN Red List as a near-threatened species, which is why an international action plan for the species was drawn up. This species is thoroughly studied only in a few European countries; therefore, the results of studies carried out in Estonia were of great importance for the action plan. In Estonia, approximately 80 persistent breeding sites are recorded, although the number of leks may exceed a hundred. The Estonian population is estimated to comprise 600 to 800 males.

The breeding sites of the Great Snipe are mainly located in larger floodplain meadows and polders. The species prefers open or semi-bushy meadows and survives better on mown or grazed sites. As the management of meadows has barely been profitable in the last dozen years, by now the Estonian population of the Great Snipe is becoming restricted to protected areas, where the management of meadows is supported by the government. Nowadays, the more numerous and important populations are located on the national parks and nature reserves. Leks are also known to be located on mires and on the polder areas. Although data on the reproduction of the Great Snipe are insufficient, the status of its population in Estonia may still be considered to be vulnerable. The main factors of threat are the destruction of lekking and nesting sites, untimely mowing, instability of natural conditions (vernal floods, fires) and probably the increasing numbers of predators.

To protect the Estonian population of this species, its habitat should be maintained. Management plan defines for these purposes 16 essential activities. For habitat conservation, larger floodplain meadows should be protected from overgrowth; their destruction by drainage or other means should be avoided. Researchers should arrange surveys on Great Snipe numbers, specify the requirements on its habitat and identify success in applied means of conservation.

Keywords: *Gallinago media*, conservation, management, lekking sites, habitat selection



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