Workshop Abstracts

WS01: Pebbles in a mosaic: Studying effects of climatic change on avian life cycles

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Research towards understanding effects of climatic change is simultaneously carried out in many parts of Europe, sometimes even on identical species. Based on the overview given in the symposium on climatic change, the workshop is intended to provide an opportunity for exchange and integration of results, and for coordination of future work. In the workshop, we hope to bring together examples of responses from a variety of birds. Most pertinently, exchanged information should include evidence for modifications of seasonal behaviour or selection pressures, or for the lack of changes that would have been predicted under climatic change. Further insights into mechanisms underlying the birds' responses are also welcome. We have organized short statements and explicitly invited contributions from all parts of Europe, and on the wide array of species that are currently under study because we believe that it is timely to bring together empirical findings. Acknowledging that effects of climatic change will be extremely complex, we hope to progress towards a picture by bringing into play „pebbles" from the full colour spectrum of scientific evidence that we currently have. Similarities and differences between individual results may help identify key factors that determine the birds' responses to climatic change. The discusssions take place in the presence of an informed climatologist and should ideally result in a tentative „web" of findings as a reference for all who actively work in the field.

WS02: Ecology and evolution of the crossbills-complex (*Loxia*)

Organizers: Pim Edelaar[1,2] Ron Summers[3] & Natalia P. Iovchenko[4]

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Ongoing studies of crossbills are unravelling previously unknown diversity and patterns. The nominate subspecies of the common crossbill (*Loxia curvirostra curvirostra*) seems to be divided into a number of distinct vocal types. American work has shown that these vocal types are most likely separate species: they differ in morphology and food specialization, and rarely hybridise. If the same is true for the newly discovered European vocal types is still unknown, but biometric, ecological and reproductive studies are underway. Currently, specific status is given to the Scottish crossbill, and specific status may be valid for distinct and ecologically specialised populations elsewhere. Given the recent increase in new, surprising and sometimes ambiguous data from a number of different researchers (both professionals and amateurs) from several countries, it would be good to meet, present and discuss the methodologies, data and ideas. Hopefully some problems can be resolved, research can be

streamlined, new avenues for future work can be identified, and existing datasets can be combined: all in an effort to come to grips with this ecologically and evolutionary fascinating species-complex.

WS02-1 Population dynamics of a resident common crossbill population

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Demographic parameters are key variables to understand the population dynamics of a species. However, the nomadic nature of Crossbills has prevented the study of variables limiting its numbers. Here we provide data on a resident Pyrenean crossbill population, which allows to study inter-year differences in survival rate and to relate them to sex, age, locality and coniferous productivity indexes.

WS02-2 Crossbill irruptions re-visited

Ian Newton

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This paper will summarise recent information on crossbill irruptions into Western Europe, and discuss ring recoveries that throw light on the likely origin of the migrants. It will update earlier information summarised in NEWTON (1970). Evidence will be presented that some individuals have bred in different localities more than 2000 km apart in different years.

WS02-3 Sexual activity, moult and movements in the annual cycle in the common crossbill *Loxia curvirostra*

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The common crossbill has some conspicuous features in its annual cycle, in addition to its capability to breed opportunistically whenever food is abundant. These include two phases of post-breeding moult, and complex relationships between moult and breeding, and between moult and seasonal movements. This paper will summarise the results of long-term field investigations of seasonal events, based on captures of crossbills in north-west Russia (Ladoga Ornithological Station) during 1968–2002, and experimental studies of photoperiodic control of sexual activity and moult. Experiments have shown that photoperiodic control is the predominant proximate factor, but the scheduling and parameters of seasonal events are dependent on the food supply to a considerable extent. Gonad development is stimulated with increasing day-length, but even in captivity under constant availability of other food, crossbills need spruce seeds to stimulate breeding. As in other birds of the temperate zone, moult starts in experimental birds a certain time later after photo-stimulation (about 4 months). In nature, the first (spring) phase of moult (started generally in late April-May) is inhibited or interrupted by increasing day-length. Normal complete post-breeding moult is carried out only under decreasing or short day-length (in nature from the middle of August to the end of November). The extent and rate of moult are under photoperiodic control. Significant differences in dates and extent of moult are found not only in individuals at the same year, but from year to year.

Post-breeding movements are an inherent seasonal event. They start generally in May. In the years with a poor current cone crop, they acquire the character of invasive movements.

WS02-4 Continuous observations at a parrot crossbill nest

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A parrot crossbill nest was filmed from laying of eggs to fledging of young, using a time lapse video camera set 30 cm from the nest. This allowed timing of all visits and feeds by the parents, and descriptions of the behaviour of adults and young.

WS02-5 Breeding biology of crossbills in Abernethy Forest, Scotland

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Abernethy Forest has only one conifer species (Scots pine) with strict seasonal production and availability of seed. In particular, the seed availability increases markedly during the brief period when the cones open to shed their seed (May), and when the trees shed their cones (July). This has a bearing on the phenology of breeding by the different crossbill species, depending on whether they can exploit closed cones or only open cones

WS02-6 Vocal alliance of Mediterranean and northern European crossbills

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Calls of crossbills in Spain, Majorca, Cyprus and Morocco all showed some joint similarities, and also similarities with parrot crossbills in Scotland. The idea that there are distinct subspecies in the Mediterranean was not supported by vocalisations.

WS02-7 Are there morphological differences between the vocal types of the common crossbill?

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Recent, repeated research has shown that the vocalisations of common crossbills fall into discrete groups, so-called vocal types. Since these types are thought to occur at least sometimes in the same area, some kind of ecological differentiation is to be expected according to the competitive exclusion principle. Such ecological differentiation has been found among the vocal types (perhaps representing true biological species) of North American crossbills. It is mostly reflected in details of

the bill morphology, since the bill plays an important role in extracting seeds from cones of different varieties and species of conifers. In 2002 more than 500 crossbills were caught, measured and recorded at release at four different localities in The Netherlands. These independently collected data sets will be used to show whether any morphological differences exist between the vocal types. Such differences do not fully exclude differentiation unrelated to ecological differentiation, but would help us to uncover if and how the vocal types are specialised on particular conifers.

WS02-8 Is there assortative mating between the vocal types of the common crossbill?

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The co-occurrence of discrete vocal types in the common crossbill points towards reproductive isolation between the types, and the existence of hitherto unrecognised biodiversity. Since the discovery of the vocal types in the last decade, several observers have looked for breeding crossbills in The Netherlands. More than thirty nests have been found where both male and female were heard or recorded. In all instances were both members of the pair of the same vocal type. Since in many cases several vocal types occurred in the same study area, this assortative mating is indicative for no or very low frequencies of hybridisation between vocal types in sympatry. Firm evidence excluding the possibility of switching from one vocal type to another, best tested by forced pairings between different vocal types in captivity, needs to be collected in the future. Genetic studies may also be able to contribute to our insight into the taxonomic status of the vocal types. Most of these crossbills are not resident in The Netherlands. Whether vocal types normally occur in allopatry and only breed sympatrically during irruption years also warrants further study.

WS02-9 Crossbill diversity and novel conifer habitats

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Crossbills with different bill sizes live sympatrically in Northeast Scotland, but use different habitats associated with their foraging and movement patterns. The diversity of available habitats is anthropogenic and recent. We speculate on the future for crossbill diversity in Scotland.

WS02-10 Comparative biometrics of common crossbills (*Loxia curvirostra*) on the Iberian Peninsula and the Bealearic Islands

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The common crossbill (*Loxia curvirostra*) is a species highly specialized in feeding on pine seeds. In Spain it is mainly associated with coniferous forests constituted by mountain pine (*Pinus uncinata*),

scots pine (*Pinus sylvestris*) or Aleppo pine (*Pinus halepensis*). Many aspects about its ecology and biology remain unknown, such as the relation between population dynamics and forest productivity, or population isolation according to feeding strategies. In 1993 we began a study on common crossbills on the Iberian Peninsula and the Balearic Islands. The aims of this work were the following: (1) To know the relationship between forest productivity and the breeding periods, (2) To verify the possible existence of different populations by studying their biometry. Samples of different coniferous forests were collected from 1993 until 2002 on the Iberian Peninsula (IP) and the Balearic Islands (BI): Sierras de Leire y Uztarroz (Navarra, IP, n = 2260), Sierra de Maigmó (Alicante, IP, n = 698), Montes de Málaga (Málaga, IP, n = 149), Sierra de Tramontana (BI, n = 48). Individuals were captured using mist nets placed next to sites where birds concentrate, such as places where salt naturally accumulates, springs and wet areas. After ringing, sexing and ageing each individual, we measured some morphological parameters and took blood samples. Significant biometric differences between sampling areas were found. This indicates a relationship between these populations and the sampling area or the habitat they live.

WS02-11 How to make your own sonogram: an introduction for beginners

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A demonstration will be made showing the equipment used to tape record crossbills in the field and how to convert tape-recorded crossbill calls to sonograms, and thereby formally identify the call type of the target bird.

WS02-P1 Relationship of moult and breeding in the Tien Shan subspecies of the common crossbill *Loxia curvirostra tianshanica*

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The subspecies *L. c. tianshanica* specialises on eating seeds of the Schrenk spruce (*Picea schrenkiana*) which ripen in July-August. This has a bearing on the phenology of breeding. The main egg-laying period is from the middle of July to the first ten days of September, though in a few years clutches can be found in other months (late December-June). The question arises: how does this subspecies solve the problem of post-breeding and post-juvenile moult, which generally takes place in late summer-autumn? There are 3 possible ways: to delay moult and then have a very fast moult, overlap moult and breeding or reduce the extent of moult. To check these possibilities I examined museum specimens at the Zoological Institute of Education and Science Ministry of Republic Kazakhstan. The earliest record of a moulting bird was 3 July. Between 3 July and 27 September 48% of crossbills were moulting, 14% had interrupted moult after renewal of 2–3 primaries and the rest (38%) had not started moulting. In the beginning of September, some birds reached stage 4–6 of moult, but other ones did not start moult before 27 September. Males started moulting when they still had maximum testis size. Some males with enlarged testes continued moult but others interrupted it after renewal of 2–3 primaries. Further, egg-laying and incubating females started moult, and some reached renewal of 6 primary. Apparently, the majority of adults overlap moult while feeding fledglings and have an intensive phase of moult in October-November. Contrary to expectations, 93% of birds had complete post-breeding moult. Young birds hatched in autumn had no post-juvenile moult, or their extent of moult was very small. As a result, crossbills breeding in juvenile plumage are recorded more often in Tien-Shan than in Europe.

WS02-P2 Comparative molecular study of populations of common crossbill (*Loxia curvirostra*) on the Iberian Peninsula and the Balearic Islands

Miriam Hernández[1], Daniel Alonso[2], Juan Arizaga[1], Ana Amézcoa[1], Fernando Alda[1], Ainhoa Murua[1], Paul-Christoph Schroder[1] & Francisco Campos[1]

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The biometric differentiation of some populations of common crossbill (*Loxia curvirostra*) in different areas of the Iberian Peninsula and Balearic Islands has been mentioned in some works. However, these differences are not known to exist at the molecular level. Thus we made a preliminary study in molecular genetics by using microsatellites. We used samples of different coniferous forests of the Iberian Peninsula (IP) and Balearic Islands (BI): Sierras de Leire y Uztarroz (Navarra, IP), Sierra de Maigmó (Alicante, IP), Montes de Málaga (Málaga, IP), Sierra de Tramontana (Mallorca, BI). Blood samples (n = 20 to 30 per location) were collected in FTA cards. We used LOX1, LOX3, LOX6 and LOX7 as microsatellite primers. Preliminary results show clear intra- and inter-population variation. Some alleles that are present in continental populations are absent in the Balearic Islands population. On the other hand, we observed a greater difference in the number of bases between the alleles in the continental populations.

WS03: From bird ringing to conservation action

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About two hundred bird species in Europe (38%) have an unfavourable conservation status, of which 24 are globally threatened. This implies a risk of (local) extinction within the time-scale of the coming generations. A full understanding of widespread declines often requires a good understanding of the population's demography through detailed analyses of survival, reproduction and dispersal, and the influence of environmental conditions upon these. This information is essential in elucidating the possible causes, predicting further changes, and developing successful antidotes to reverse population declines. Progress in this field has accelerated recently with the development of advanced statistical models to analyse mark-recapture and mark-recovery data, including those which are generated on large geographical scales by bird ringing schemes.

The aim of this workshop is to intensify the link between the analysis of bird ringing data and conservation action. This can be done by bringing together scientists with conservationists and discussing the latest state-of-the-art work in this field. We are interested to talk about work using mark-recapture/mark-recovery models to understand avian population dynamics in the context of changing environments. Much insight can be gained from case-studies, in particular those which are carried out before and after conservation action.

WS03-1 The effect of reducing power line accidents on population growth of white storks *Ciconia ciconia*

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The enhancement of survival rates can be an effective conservation strategy. This can be most efficiently done if different sources of mortality can be distinguished and quantified, so as to identify the importance of those factors which can actually be changed. We analyzed mark-recovery data of the endangered white stork *Ciconia ciconia* ringed in Switzerland from 1984–2000 using a multistate capture-recapture model and estimate the proportion of storks that died due to collisions with overhead power lines. The proportion of white storks dying because of power line collisions among all dead storks decreased over time and averaged 0.37 ± 0.08 (SE) in juveniles and 0.35 ± 0.09 in adults. The annual survival rate of juveniles was 0.33 ± 0.05 and of adults, 0.83 ± 0.02. Power line mortality is thus important for white storks, with about 1 in 4 juveniles and 1 in 17 adults dying each year because of power line collision. Under the assumption that power line mortality is completely additive to the remaining mortality, we estimate with a Matrix projection model that a hypothetical reduction of power line accidents by 10% would increase the population growth rate from actually 1.004 to 1.020. With this new approach it is possible to rank different conservation actions according to their expected effect on population growth rate.

WS03-2 Is a black tern *Chlidonias niger* population model without ringing data possible?

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In The Netherlands the black tern has declined considerably as elsewhere in West-Europe. The effect of various conservation strategies on population size can be tested with population models if population parameters as well as correlating environmental factors are applicable.
Reproductive success of black terns is severely influenced by the lack of nest sites (VAN DER WINDEN *et al.* in press), deterioration of food quality for chicks (BEINTEMA 1997 – Colonial Waterbirds 20: 558–565), as well as increased disturbance (VAN DER WINDEN 2002 – Vogelwelt 123: 33–40). The conservation strategies to cope with this include provision of rafts, improvement of feeding habitat and lowering disturbance effects.

In general information about reproductive success as well as mortality are used to predict population trends. The four main Dutch breeding habitats show different breeding number trends, caused by different factors responsible for the low reproductive output of black terns (VAN DER WINDEN et al., Ardea, in press). In the period 1994–1999 detailed breeding success data were collected in these four habitats. However good mortality rates (adult or subadult) are lacking throughout the breeding range. If mortality rates from other small tern species (SERVELLO 2000: – Waterbirds 23: 440–448) are included in a matrix model, the predicted population trend nearly fits the observed breeding number trend for the period 1985–2000. This prediction gains in accuracy if population trends are predicted for each habitat type separately and summed afterwards to a nation wide trend.

Assuming the breeding number trend is precise and immigration or emigration is limited, the remaining deviation between the observed and predicted trend can be attributed to differences between black tern mortality and the average mortality of related tern species. After calibration for this mor-

tality rate by fitting the model to the observed trend, the model can be used to predict future trends with additional assumptions such as source-sink relations between different habitat types. Also different management strategies can be evaluated as relations with reproductive output are known. Although direct empiric data on mortality rates from ringing studies are lacking, accurate trend data can be used to estimate them if data on reproductive output are available. For many Red List bird species population trends are monitored quite well and data on breeding success are available. Given the assumptions, the presented method can be used to estimate, much needed, mortality rates on threatened species without using time and resource expensive mark-recapture methods.

WS03-3 Dutch farmland birds: ringing as a tool in conservation and research

Berend Voslamber, Ben Koks, Kees Koffijberg, Wolf Teunissen & Ruud Foppen

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The new Dutch atlas of breeding birds clearly shows that in The Netherlands farmland birds, like meadow birds and birds of arable fields, have shown a dramatic decline in the last 25 years. Since 70% of the country consists of farmland and for some species this decline is significant even for the European dimension it should come as no surprise that conservation policy has acknowledged this. Farmland birds are a conservation priority nowadays. This results in protection plans for species like corncrake, montagu's harrier, meadow birds and birds of arable fields. On the other hand a group of farmland birds is experiencing a time of prosperity. Geese, for instance, do not only appear in much larger numbers in winter time, but also have rapidly growing breeding populations. As a consequence this might influence present species composition and is expected to cause larger damage to agricultural crops. Ringing already takes place in geese since the early nineties. Species breeding in arable fields have been ringed from more recent years onwards.
Developments in the different populations give rise to a large number of research questions. We will present research that SOVON is conducting on a number of farmland bird species. Besides discussing some results we will elaborate on the possible reasons behind the observed distribution and population changes and ways to counteract these by taking measures, either from a conservational or a management perspective.

WS03-4 Ringing and the conservation biology of red-backed shrikes

Hans Esselink

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(Abstract not available in time)

WS03-5 From bird ringing to conservation action: a North American perspective

Mary Gustafson

USGS Patuxent Wildlife Research Center, Laurel, USA

(Abstract not available in time)

WS04: What information can be obtained from failed eggs as to the causes of hatching failure?

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All researchers that are involved in studies of avian reproduction observe egg hatching failures. Sometimes, loss of reproductive capacity may be substantial. For example, in the barn owl *Tyto alba* failures account for up to 30% of all eggs. Egg failures are often associated with other fitness parameters such as non-laying, poor parental condition and poor offspring survival. So, understanding the causes of egg failures is very valuable in avian studies. In poultry science, a lot of research has been dedicated to virtually every possible cause of hatching failure. In wild birds, studies of hatching failure focused primarily on the effects of toxins (e.g. pesticides, heavy metals, PCB's). Concerning natural causes, effects of social behaviour, nutrition, and genetic similarity and inbreeding have been put forward. These studies of wild birds cannot be used by fieldworkers who try to find the cause of egg hatching failure in 'their' species. To analyse why eggs fail in particular cases, it is important to perform a directed search among the full range possibilities. To start with, failed eggs should be carefully diagnosed; in many cases, failed eggs reveal a lot of information about the cause of failure. This diagnosis involves comparison between anomalies in wild birds eggs with poultry data. In this workshop we would like to show, based on actual case studies on wild birds, the nature of the information that can be derived from failed eggs and what conditions correspond to which causes. We hope to stimulate researchers to look carefully at failed eggs and offer help in diagnosing the causes of failure in cases put forward by participants.

Topics of this workshop include: egg fertility, microbial infections, malpositions of the embryo, effects of inadequate incubation temperature and humidity, effects of insufficient egg turning, effects of malnutrition, effects of pesticides and PCB's, anomalies of the embryo, anomalies of the embryonic membranes, twinning, and developmental ages of dead embryos.