

## Annual Conference – Abstracts of talks

### **An objective method of quantifying the avian interest of an area by means of a weighted population index**

G.E. Austin, A.J. Musgrove, M.J.S. Armitage & M.M. Rehfisch

*British Trust for Ornithology, The Nunnery, Thetford, Norfolk IP24 2PU, UK, e-mail: graham.austin@bto.org*

When considering the overall importance of an area for waterbirds, it is appropriate to combine in some way the whole assemblage of species present. This is usually done either by summing the number of species or the number of individuals of all species. Although such methods are well established, in most cases birds are summed in such a manner that individuals of different species have equal value. However, the presence of small numbers of a scarce species may be as notable in conservation terms as large numbers of a common species. For example, the wader assemblage of many UK estuaries, based solely on summing the individuals of all species, would be dominated, numerically, by Dunlin *Calidris alpina*.

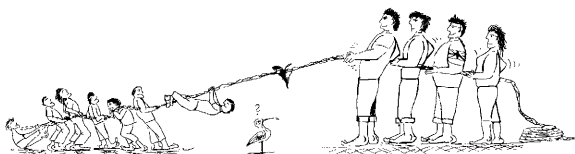
It follows that it may be beneficial to use a method of summing the number of birds at a site that weights the numbers of each species according to its population size, giving more weight to individuals from small populations. We have therefore developed the concept of the Threshold Importance Unit (TIU). In order to demonstrate how TIUs might be used, we draw on work undertaken as part of the UK's Wetland Bird Survey where this concept has already been applied to describe the numbers and distributions of waterbirds, both within well-defined sites and along open coastlines.

### **The Wetland Bird Survey Alerts System – an objective method of identifying important changes in numbers of wintering waterbirds in the United Kingdom at national and local scales**

Graham Austin

*Wetland and Coastal Ecology Unit, British Trust for Ornithology, The Nunnery, Thetford, Norfolk IP24 2PU, e-mail: graham.austin@bto.org*

This paper introduces the Wetland Bird Survey's Alerts system. The Alerts System provides a standardised technique with which to monitor changes in the population sizes of



*The English team won the competition, because nobody was prepared to compete with professionals.*

wintering waterbirds in the UK, over a range of spatial scales and time periods using data collected as part of the Wetland Bird Survey.

### **The impact of the Cardiff Bay Barrage on wintering waterbirds**

Niall Burton

*British Trust for Ornithology, The Nunnery, Thetford, Norfolk IP24 2PU, UK, e-mail: niall.burton@bto.org*

Cardiff Bay, a 2 km<sup>2</sup> area of mudflats and saltmarsh at the mouth of the Severn Estuary in the UK, was enclosed by a barrage on 4 November 1999. This created a recreational lake that now forms the centre point for the redevelopment of Cardiff's former docklands. The impacts of this habitat loss upon the waterbirds that formerly wintered in the Bay have been the subject of a long-term study by the British Trust for Ornithology. Peaks of 300 Shelduck, 700 Dunlin, 160 Curlew and 340 Redshank occurred in the Bay in the winter of 1998/99, immediately before barrage-closure.

Following the closure of the barrage, the average number of waterbird species using the Bay has fallen from 26.5 to 20.7 per year. The number of wader species recorded each year has halved. The Bay is now primarily used as a roosting site by the four main species studied (Shelduck, Dunlin, Curlew and Redshank) and their numbers have fallen sharply.

Colour-ringing and radio-tracking studies revealed that the majority of Redshanks moved to the Rhymney Estuary, only 4 km away. Many of these birds were forced to use a highly disturbed area that had previously only been used at night. The mass of birds displaced from the Bay was significantly lower than that of other birds using the Rhymney site in the winter following barrage-closure. Survival over this period also decreased. The continuing study aims to determine whether this increased mortality rate is sustained over subsequent winters.

### **Territoriality of African Black Oystercatchers *Haematopus moquini* on Robben Island**

K.M. Calf & L.G. Underhill

*Avian Demography Unit, University of Cape Town, Rondebosch 7701, South Africa  
e-mail: kathy@adu.uct.ac.za*

The African Black Oystercatcher *Haematopus moquini* is the only representative of the family Haematopodidae that breeds in Africa, populating the coast of South Africa and Namibia. In the early 1980s, it was estimated that the African Black Oystercatcher had a world population of about 5,000 birds and it is classified as "near-threatened" both in South Africa and globally. Adult African Black Oystercatchers inhabit the open coast and offshore islands. They are territorial and most stay on the same territory throughout the year. They are long-lived and mate-faithful with a naturally



low reproductive rate ( $\leq 2$  fledglings per pair per year).

This study was conducted on Robben Island, South Africa, from October 2001 to September 2002. The island has a coastline of about 10 km and the shoreline is rocky with various degrees of exposure, dependent on the extent of off-shore reefs. Despite human disturbance to limited areas of the shore, between 1977 and 2001 the number of oystercatchers increased from 40 to c. 190 individuals. As a result, Robben Island is now an important site for the conservation of the species because of the substantial and expanding population. To determine the exact population size and the extent of the expansion of the breeding population, counts of adults, pairs, nests, chicks and fledglings were conducted fortnightly from 5 November 2001 to 4 May 2002 along the entire coastline. During each count, the GPS position of each bird or pair was noted to facilitate the identification of territories and determination of territory size. Pairs were defined as birds that roosted and fed close to each other, but were not necessarily breeding. Nests were searched for regularly and, once found, were monitored at 4–7 day intervals until hatching. Similarly, chicks were monitored until fledging. Although oystercatchers remain with their parents for several months, fledging was taken as the point at which chicks can fly well, which occurs at an age of about five weeks, when the chicks reach two-thirds of adult body mass. Fledglings were counted until they left the breeding territory to head for nursery areas on the Namibian coast.

### Waders, weight and winter weather

Jacquie Clark

Wash Wader Ringing Group, British Trust for Ornithology and University of East Anglia, The Nunnery, Thetford, Norfolk IP24 2PU, UK  
e-mail: jacquie.clark@bto.org

Waders wintering in temperate regions show an annual mass cycle, increasing in mass for migration and also increasing to a mid-winter peak followed by a decline. This winter cycle is thought to arise through a trade-off between carrying fat as 'insurance' against periods when food might be hard to obtain and maintaining a low mass and therefore good manoeuvrability to reduce the risk of predation. This study looks at the mass cycle of waders wintering on the Wash, E England, and investigates the effectiveness of this insurance against severe winter weather and how it varies between species.

As waders are usually caught in large numbers over a short period of time, birds have to be held in temporary captivity. During this time they lose mass through food-processing and water loss. The time between capture and weighing varies, so mass loss was measured and a model to correct for both time in captivity and time since high tide (a proxy for time of last feeding) was produced and used to correct all measurements of mass.

The mass cycles of a number of wader species in non-severe winters were used to model the effects of day-length and temperature on mass. Different patterns were found. For example, Grey Plover and Redshank, species that are susceptible to severe weather, appeared to be unable to maintain the same mass at low temperatures when day-length was short as they could during longer days, suggesting that day-length may be critical. By contrast, Dunlin and Knot, which are less

susceptible to the effects of severe weather, appear to maintain a higher mass at low temperatures when day-length is short than when it is long, suggesting an ability to react to low temperatures by increasing mass.

The mass of birds caught alive and found dead in severe weather periods was compared to the normal mass of that species at that time of year. The birds found dead were well below the normal mass. Differing patterns were again found. For example, Grey Plover had a lower than expected mass in severe weather but Dunlin had a higher than expected mass. This also suggests that vulnerable species are those that are unable to react to the severe weather by maintaining or increasing their mass. The differences between species probably relate to feeding-method, prey-type and the ability to exploit different prey and feeding areas when conditions change.

This study suggests that feeding time may become a critical factor for some species in severe weather. This may mean that, during severe weather, disturbance may become a significant factor affecting survival. However, with global warming, there are likely to be less severe weather spells in Britain in future so the importance of consequent mortality and poor condition is likely to decline. If this has been a controlling factor in the past, then there might be implications for both wader distribution and population levels.

### Four decades of study of the Rock Sandpiper and still so many questions

R.E. Gill Jr.<sup>1</sup>, P.S. Tomkovich<sup>2</sup> & B.J. McCaffery<sup>3</sup>

<sup>1</sup> U.S. Geological Survey, Alaska Science Center, 1011 East Tudor Road, Anchorage, AK 99503  
e-mail: robert\_gill@usgs.gov

<sup>2</sup> Ornithology Department, Zoological Museum, Moscow State University, Bolshaya Nikitskaya Str. 6, 103009 Moscow K-9, Russia  
e-mail: pst@zmmu.msu.ru

<sup>3</sup> U.S. Fish and Wildlife Service, Yukon Delta National Wildlife Refuge, PO Box 346, Bethel, AK 99559  
e-mail: brian\_mccaffery@fws.gov

The Rock Sandpiper *Calidris ptilocnemis* is the Beringian counterpart of the Atlantic Purple Sandpiper *C. maritima*. Its biology was recently summarised by us in the *Birds of North America* series. A standard feature of these accounts is to address information gaps and research needs. Here we discuss some of the more important gaps in knowledge revealed to us during this exercise.

The foremost need is a clearer understanding of the taxonomy, distribution, movements and mixing of the various subspecific populations, of which four are recognised; a fifth, *C. p. kurilensis*, is probably a valid subspecies but it is the least known of the taxa owing to its small, isolated population. Zones of nesting sympatry or contact between mainland nesting *tschuktschorum* and *couesi* and insular nesting *tschuktschorum* and *ptilocnemis* are suspected, but as yet unknown. Understanding of this might best come from analysis of molecular markers coupled with more powerful assessments of morphological characters.

Another issue is the use of space during all seasons and at different scales. For instance, are *couesi* from the Aleutian Archipelago and *quarta* from the Commander Islands sedentary, or does some proportion of their populations move



east during the non-breeding season – *quarta* into the range of *couesi* and *couesi* within or out of its range? The insular-nesting nominate subspecies of the northern Bering Sea appears to be the only population with a moult migration, but exactly where and when this occurs remains unclear. Generally, use of specific wintering areas among all subspecies is poorly known, especially at sites along the Alaska Peninsula and the northeast Pacific coast.

Breeding densities appear to fluctuate markedly, especially among insular-nesting populations, but no population-level assessments have been made for any subspecies. The large number of birds wintering in Cook Inlet, Alaska, affords opportunities to address several questions related to wintering ecology of shorebirds at northern latitudes, not only in terms of adaptations involving fattening, environmentally-induced starvation, and thermoregulation/hypothermia, but also for such things as the sensory mechanisms used for prey detection in a largely nocturnal and frozen environment. General studies of the geographic variation in vocalizations are needed, as are specific studies of the context and structural variations in the song and other breeding-season calls. Among all populations, the large proportion of second-year birds apparently breeding is puzzling and warrants detailed study of mortality and population demographics. Lastly, the parental care system among Chukotka-nesting *tschuktschorum* differs from most monogamous arctic-nesting waders in that one of the mates (female or less commonly male) can desert the nest or brood at any time. What drives this behaviour?

### Sanderlings in the Wadden Sea

Klaus Günther

WWF Germany, Monitoring of Migratory Birds in the Wadden Sea of Schleswig-Holstein, WWF Germany Project Office Wadden Sea Norderstrasse 3D-25813 Husum, Germany, e-mail: guenther@wwf.de

A large proportion of the East Atlantic Flyway population of Sanderlings *Calidris alba* migrate through the Wadden Sea. During spring migration, numbers are highest in May in all areas of the Wadden Sea. On autumn migration, numbers peak over a longer period from August to October and vary much more in different parts of the Wadden Sea. A few thousand birds remain over winter especially in the southwest. It is well established that Sanderlings prefer to feed and roost on sandy tidal flats, beaches and sandbars far away from the mainland coast. However, there are some interesting exceptions, especially in Schleswig-Holstein in May where up to 13,000 Sanderlings roost during high tide on the mainland coast at the edge of a saltmarsh. An unusual feeding habitat for up to 2,000 Sanderlings in May is to be found in the brackish zone of the Eider estuary behind the storm barrier, where they feed alongside Bar-tailed Godwit males on *Corophium* spp. on muddy tidal flats. The distribution of Sanderlings can vary considerably from year to year. On the basis of departure observations at the end of May and early June, it is very likely that the Wadden Sea Sanderlings are mainly of Nearctic origin. During the winter and migration periods, only a few colour-ringed individuals have been recorded away from the Wadden Sea. Most were from various places further south, particularly on the Atlantic and Mediterranean coasts, but also by a lake in Switzerland.

### Avocet chicks in different latitudes: comparison of thermoregulation, time budgets and energy expenditure of chicks from northern Germany and southern Spain

Ralf Joest<sup>1</sup>, Hermann Hötter<sup>2</sup>, Gonzalo Munoz Arroyo<sup>3</sup> & G. Henk Visser<sup>4</sup>

<sup>1</sup>Am Bahndamm 10, 59597 Erwitte, Germany  
e-mail: ralfjoest@yahoo.de

<sup>2</sup>NABU Institut, Bergenhusen, Germany,

<sup>3</sup>Facultad de Ciencias del Mar, Universidad de Cadiz, Spain,

<sup>4</sup>Centre for Isotope Research, University of Groningen, the Netherlands

Compared to other wader species, the breeding distribution of Avocets *Recurvirostra avosetta* covers a wide latitudinal range, extending from the Wadden Sea coast in NW Europe to continental central Asia, the Mediterranean and southwards to E and S Africa. Within this area, they are exposed to a wide range of climatic conditions. This is a special challenge for their precocial chicks, which, due to their exposed lifestyle, poor insulation, lower metabolic capacity and relatively high surface to volume ratio are particularly vulnerable to unfavourable climatic conditions. In order to understand the ethological and physiological ways in which chicks adapt to climatic conditions at different latitudes, we compared the development of homeothermy, energy expenditure as measured by the doubly labelled water method and time budgets of avocet chicks growing up on the German Wadden Sea coast (the northern border of the species range) and in the Bay of Cadiz in southern Spain.

### Types of territorial interactions in Grey Plovers

J. Kasatkina

107143 Moscow, Otkritoe shosse st., 21-8-143  
e-mail: kasatka13@yandex.ru

The territorial interactions of Grey Plovers *Pluvialis squatarola* were studied on wintering grounds and at stopover sites during autumn migration on the western coast of the Caspian Sea. Interactions were categorized into three types as follows: (1) "instant exile" – momentary direct physical contacts, (2) "ratio determination" – prolonged ritualised interactions without direct aggression and (3) "intermediate" – other contacts, neither instant exile nor ratio determination, but combining features of both: approaching another bird, some elements of ritualised contacts and, at the opposite extreme, direct aggression.

It was found that the type of interaction was affected by the ecological situation. In stable feeding conditions with a stable social structure, there was a higher incidence of ratio determination as well as some intermediate interactions. Conversely non-stable conditions led to an increase of instant exile and especially intermediate interactions. It is suggested that the type of territorial interaction is probably determined by neighbour familiarity.



## Population trends of waders in Sweden

Åke Lindström

Department of Animal Ecology, Lund University,  
Ecology Building, 223 62 Lund, Sweden, and Ottenby  
Bird Observatory, Pl. 1500, 380 65 Degerhamn,  
Sweden, e-mail: ake.lindstrom@zooekol.lu.se

I review information about population trends of common wader species breeding in Sweden, or passing through Sweden on migration (arctic breeders). The analysis is based on two main data sources: (1) The Swedish Common Breeding Bird Census (since 1975) and (2) regular trapping and observations at Ottenby Bird Observatory (since 1946). Data-quality ranges from good to tentative. Data are presented for 10 of the 29 wader species breeding in Sweden, and for nine wader species (mainly arctic breeding) occurring regularly on passage.

For Swedish breeding populations, a decline in numbers over the last 30–50 years has been recorded for Lapwing *Vanellus vanellus*, Common Snipe *Gallinago gallinago*, Redshank *Tringa totanus*, Wood Sandpiper *T. glareola*, and Ruddy Turnstone *Arenaria interpres*. Populations seem stable for Broad-billed Sandpiper *Limicola falcinellus*, Eurasian Curlew *Numenius arquata*, Green Sandpiper *T. ochropus* and Common Sandpiper *Actitis hypoleucos*. Little Ringed Plover *Charadrius dubius* may have become more common.

Among waders passing through Sweden, Ringed Plover *Ch. hiaticula*, Ruff *Philomachus pugnax* and Woodcock *Scolopax rusticola* have declined in numbers, and Temminck's Stint *Calidris temminckii*, Little Stint *Ca. minuta*, Red Knot *Ca. canutus*, Curlew Sandpiper *Ca. ferruginea* and Dunlin *Ca. alpina* populations seem stable.

Population data are not available for a large number of species, particularly those breeding in northern Sweden.

## Estimating the distribution of the start of incubation: the African Black Oystercatcher *Haematopus moquini* as an example

Sandra D. Matanyaire, Kathy M. Calf &  
Les G. Underhill

Avian Demography Unit, University of Cape Town,  
Rondebosch, 7701, South Africa  
e-mail: Lgu@adu.uct.ac.za

This methodological paper shows how careful taking of measurements and masses of eggs during incubation can be used to estimate the distribution of the starting dates of incubation. Biologically, the method is based on the fact that eggs lose mass steadily from the start of incubation. Linear regression is used to "backcast" the dates at which eggs had their estimated laying mass. The kernel method is used to estimate the probability distribution of incubation starting dates. Various parameters of interest, such as the median starting date and other percentiles, are estimated. Using the bootstrap, confidence intervals for these parameters are found. Randomisation methods can be used to do statistical tests. For example, the null hypothesis that the median starting date is the same at two sites (or in two years) can be tested. The paper will be based on data collected for the African Black Oystercatcher on Robben Island in the 2001–2002 breeding season. The presentation will be practical, rather than theoretical.

## Current numbers of Great Snipe *Gallinago media* in Belarus: probable trends and causes of population decline

Edward Mongin

Institute of Zoology, Akademicheskaya str., 27,  
220072 Minsk, Belarus  
e-mail: mongin@biobel.bas-net.by

Data on numbers, distribution and habitat selection of Great Snipe in Belarus were collected in the framework of the OMPO (Migratory Birds of the Western Palearctic) International Program "Snipes". It was the first special study of this species and was undertaken during 2000–2001.

Intensive research was carried out in the majority of administrative districts in Belarus. Fifty-five Great Snipe leks were located during the survey, including 10 previously known. In addition, birds were found at 10 foraging sites used during the breeding season. The current breeding population of the Great Snipe in Belarus is estimated at 4,600–6,000 males. This is based on the number of lekking males at known leks and estimates of the numbers using leks in floodplain meadows that were not surveyed.

Most leks (71%) were found in floodplain meadows suggesting that they are the preferred breeding habitat and 18.2% were found in fen mires. Only a few were located in areas that had been drained (5.5%). In all such cases, however, previously drained lands were either undergoing a process of secondary swamping or were temporarily flooded. Also a few leks were found in transitional (mesotrophic) mires (5.5%).

The data on population trends of Great Snipe in Belarus are extremely limited, but undoubtedly a considerable decline has occurred over the last 40 years. Datskevich (1998) recorded a decline of the breeding population in Belovezhskaya pushcha between the mid 1950s and the 1990s. During the 1980s, breeding birds disappeared from the Lesnaya River floodplain meadows and the Dikiy Nikor fen mire (in the vicinity of Belovezhskaya pushcha). The author related this to drainage activities carried out in the region. Great Snipe leks were not found at these localities in 2000–2001. Duchits (1972) wrote that Great Snipes stop breeding in fen mires during the first stage of drainage activities.

Probably hunting has had significant negative impact on the Great Snipe population as a whole, as it has in Belarus. Vladyshevsky (1966) noted that intensive hunting in August was extremely harmful not only for migratory birds, but also for local breeders, which usually remain in their breeding sites until the last ten days of August.

Undoubtedly, loss of the main habitats – fen mires and floodplain meadows – is the principal reason for the decline in the Great Snipe population of Belarus. According to Golod (1994), the area of floodplain meadows and fens has been reduced by at least 50% during the past 40 years. Therefore it is reasonable to suppose that during this period the breeding population of Belarus has halved because of habitat loss alone.

No alternative habitats suitable for Great Snipes have been created in Belarus as a result of human activities. Only leks used by single birds were found in polders, but these sites were subject to secondary swamping or located near natural floodplain meadows.



## **“Waterbirds at Low Tide” – the UK WeBS Low Tide Count Atlas**

Andy Musgrove

*WeBS National Organiser (Low Tide Counts), British Trust for Ornithology, The Nunnery, Thetford, Norfolk IP24 2PU, e-mail: andy.musgrove@bto.org*

An “atlas” is currently being prepared summarising the first seven winters of the Wetland Bird Survey Low Tide Count scheme (1992–93 to 1998–99). The outline of the book will be described along with examples of the results obtained. The issues that need to be taken into consideration when interpreting low tide counts will also be discussed.

## **Trends in mass and numbers of Red Knots, Ruddy Turnstones and Sanderlings on the Delaware Bay, USA**

Larry Niles<sup>1</sup>, Kathy Clark<sup>1</sup>, Clive Minton, Nigel Clark,  
Allan Baker & Humphrey Sitters

<sup>1</sup> *NJ Endangered and Nongame Species Program,  
501 E. State St., PO 400, Trenton, NJ, 08625-0400,  
USA, e-mail: Larry.Niles@dep.state.nj.us*

In May each year, six species of Arctic-nesting shorebirds stopover in Delaware Bay, USA, to build mass by feeding on the eggs of the horseshoe crab *Limulus polyphemus*. These abundant, nutrient-rich, pin-head-size eggs allow the birds to build sufficient mass to complete a non-stop flight to Arctic breeding grounds.

During 1997–2002, we conducted weekly bay-wide aerial counts and captured 20,092 shorebirds to study trends in mass and numbers of Red Knots, Ruddy Turnstones and Sanderlings. Our data confirmed the importance of Delaware Bay stopover habitats with mass increases of 40% or more in all three species and daily increases of up to 15% per day. Red Knots increased mass by as much as 92% (e.g. in 1998, the mean mass of samples increased from 105.0g to 205.1g), having arrived at masses lower than at any comparable stopover in the world (mean arrival mass/year of 109–122g). At the same time, the stopover is relatively short (around 15 days), made inflexible by an early start of Arctic breeding. Therefore rates of mass gain achieved in Delaware Bay are all the more important.

Following a significant decline in horseshoe crab numbers and available eggs (estimated by some at 90% since 1990), we found that the crude rate of mass increase in Red Knots caught (i.e. not necessarily individuals) declined from 1997 to 2002.

Aerial counts showed that the peak in Red Knot numbers in 1997 and 1998 coincided with the peak in mass, indicating a successful stopover and consequent departure. In 2000 and 2001, however, Red Knots apparently left Delaware Bay at much lower masses. We infer that this was a consequence of insufficient resources of *Limulus* eggs in Delaware Bay. This is supported by observations in 2001 and 2002 that a large proportion of the Red Knot population (at least 25%) fed regularly on alternative foods on the Atlantic coast (blue mussel *Mytilus edulis* spat in 2001, surf clams *Donax variabilis* in 2002).

Ruddy Turnstones, which have the ability to excavate *Limulus* egg masses, and Sanderlings, which use alternative

food resources on the Atlantic coast beaches, increased their stay each year with >50% of their respective populations still in Delaware Bay in the second week of June 2001, two weeks after their departure date of earlier years.

This apparent decline in ability to gain mass, especially in Red Knots, may lead to an increase in mortality during onward migration to the Arctic and/or to a reduction in breeding success. Moreover the shorebirds have become more concentrated into smaller and fewer areas of Delaware Bay where *Limulus* eggs are still available. This makes them more vulnerable to predation, increases competition, and exacerbates the effects of disturbance. Perhaps these are the reasons why the peak number of Red Knots passing through Delaware Bay in May has declined from 50,360 in 1997 to 31,695 in 2002. This decline parallels a similar decrease in numbers counted in the wintering areas of South America over the same period.

## **Genetic structure of redshank populations breeding in Scandinavia**

Richard Ottvall

*Lund University/Gotland University, Dept. of Animal Ecology, Ecology Building, SE-223 62 Lund, Sweden  
e-mail: richard.ottvall@zoekol.lu.se*

Morphological data suggest that three subspecies of redshanks occur in the Western Palearctic: *Tringa totanus robusta* breeding on Iceland and the Faeroe Islands, *T. t. britannica* breeding in Great Britain, the Netherlands, Germany and S Scandinavia and *T. t. totanus* breeding in N Scandinavia. Preliminary DNA-analysis has revealed little genetic differentiation in mitochondrial DNA among redshanks. In this study, I have used Amplified Fragment Length Polymorphism (AFLP) to study the genetic structure among redshank populations in Scandinavia. I typed 75 birds from five different populations for 23 informative AFLP markers obtained by screening 5 AFLP primer combinations. No significant genetic differentiation was found ( $F_{st} = 0.00$ ) among southern populations. However, a few genetic markers differed substantially in frequency between northern and southern Scandinavia. This genetic difference is consistent with morphological data. It also suggests that the southern populations sampled in the present study belong to a pan-mictic unit.

## **Changes in Ruff *Philomachus pugnax* body mass during northward migration in Southern Belarus**

Pavel Pinchuk<sup>1</sup> & Natallia Karlionava<sup>2</sup>

<sup>1</sup> *Institute of Zoology, Akademichnaya Str. 27, Minsk 220072, Belarus, e-mail: bym@biobel.bas-net.by*

<sup>2</sup> *Gomel State University, Sovetskaya Str. 106, Gomel 246000, Belarus*

We present data on mass variation in Ruffs *Philomachus pugnax* during the spring migration seasons of 2001 and 2002 in the Pripyat floodplain, Southern Belarus.

In total, 454 adult males, 77 second-year males, 249 adult females and 18 second-year females were ringed, measured and weighed from mid-March to mid-May. For the purposes of analysis, all data were grouped in standard 5-day periods.



The mean body mass of adult males increased from 193 g at the end of March to 239 g in the first ten days of May. The increase of body mass was statistically significant (ANOVA,  $F_{2,780} = 21.54$ ;  $p < 0.0001$ ). The maximum mean masses were recorded in the peak of migration around the end of April and beginning of May. Minimum masses of individuals were 164 g (on 2 April), 166 g (1 April) and 168 g (4 May). The highest individual masses were 287 g (29 April), 288 g (5 May), 290 g (8 May) and 299 g (6 May).

Females arrive at the Pripyat floodplain one month later, on average, than males. Mean body mass varied only from 116 g to 119 g. There was no significant change in the body mass of females between the beginning and end of the migration period ( $F_{4,587} = 0.35$ ;  $p = 0.85$ ). Individual masses of adult females varied from 80 g to 156 g.

Second-year males and second-year females had lower mean weights than the respective adult categories (t-test, for males  $p < 0.0001$ ; for females  $p < 0.001$ ). Mean body mass of second-year males varied from 189 g to 196 g. Individual masses of second-year males varied from 159 g to 253 g; second-year females, from 100 g to 126 g. There was no significant change in the body mass of second-year males during spring migration ( $F_{1,714} = 1.01$ ;  $p = 0.41$ ). The number of second-year females trapped was insufficient for an analysis of body mass variation.

The average weights of adult birds (especially males) were higher than those reported from other areas in Europe during spring migration.

Two birds were recaptured at the ringing site in the following year. Five were recaptured later in the same year with maximum periods between first and second captures of 15–17 days.

### **Waders in the Caspian Sea region: does competition regulate their interspecific relationships on staging areas?**

Andrey Shubin

Moscow State Pedagogical University, Zoology & Ecology Dept., Kibalchicha 6, building 5, Moscow 129278, Russia, e-mail: andrey\_shubin@mtu-net.ru

Interspecific competition was studied among waders at sites on the west coast of the Caspian Sea and at steppe wetlands in SE European Russia. Data on foraging, aggressive behaviour and food abundance were analysed for 14 passage migrants and six wintering species.

In August, most species that fed together in each micro-habitat showed high similarities in their feeding behaviour and peck rates. Probably this was a result of the high abundance and low species-diversity of their prey, mainly Chironomid larvae. In January, feeding behaviour and prey-size differed significantly between species.

On the coast of the Caspian Sea in both August and January, interspecific aggression and territorial behaviour was more common than in the steppe wetlands and there were greater differences between species in foraging habits, especially in sites where prey was less abundant. Probably there is less competition between species in the steppe wetlands because of more abundant food supplies there.

### **Lunar periodicity in the weights of six sandpiper species in NW Australia**

Humphrey Sitters<sup>1</sup>, Clive Minton, Rosalind Jessop & Peter Collins

<sup>1</sup>Limosa, Old Ebford Lane, Ebford, Exeter EX3 0QR, UK, e-mail: hsitters@aol.com

The immatures of six sandpiper species that overwinter in NW Australia – Red-necked Stint *Calidris ruficollis*, Curlew Sandpiper *C. ferruginea*, Terek Sandpiper *Xenus cinereus*, Grey-tailed Tattler *Heteroscelus brevipes*, Red Knot *C. canutus* and Great Knot *C. tenuirostris* – showed a lunar periodicity in their weights during a study in Aug–Oct 1998. The weights were about 10% higher around full moon than around new moon, after controlling for variation arising from other factors such as body size. NW Australia enjoys completely cloudless skies during Aug–Oct and there is no light pollution. Therefore nocturnal illumination would have depended entirely on the phase of the moon. The study was limited to immatures because they are sedentary throughout the whole of their second calendar year. In contrast, the weights of adults during Aug–Oct would have been affected by factors related to migration.

We discuss the following hypotheses:

1. The weight cycle is endogenous and arises because the risk of predation is higher over new moon than over full moon and/or because the risk of starvation is higher over full moon than over new moon or
2. The weight cycle reflects better feeding conditions over full moon when prey becomes more available and/or it becomes easier to catch, probably because of better visibility.

### **Turnstone and wheat: vegetarianism or problems with intertidal prey?**

Jennifer Smart<sup>1</sup> & Jennifer Gill<sup>2</sup>

<sup>1</sup> School of Biological Sciences, University of East Anglia, Norwich, NR4 7TJ, UK

e-mail: markandjen@buckenham.fsnet.co.uk

<sup>2</sup> School of Biological Sciences & Tyndall Centre for Climate Change Research, University of East Anglia, Norwich, NR4 7TJ, UK

Many shorebird species forage almost exclusively in intertidal habitats. When they choose to forage in other habitats, it may either be a response to deteriorating intertidal food supplies or to the discovery of more profitable resources elsewhere. Distinguishing between these two processes is important for identifying potential problems with intertidal invertebrate populations.

Since January 1998, Turnstones *Arenaria interpres* on the Wash estuary, SE England, have been foraging on wheat and fishmeal on the dockside at Port Sutton Bridge and on adjacent river edges and arable fields. This raised concern that intertidal food supplies were no longer sufficient to support the wintering Turnstone population. To assess whether this was likely to be the case, the distribution and foraging behav-

