Newsletter 2009

Introduction

In 2003, the University of Groningen started a long-term population study on the Ruff, one of the most abundant wader species in Eurasia. It is, however, very much dependent on wet inland habitats, which makes it vulnerable to anthropogenic changes in land-use. In the last few decades, the Ruff has become a rare breeding bird in many Western European countries; in The Netherlands it is virtually extinct now. However, during spring migration thousands of Ruffs still pass through The Netherlands between mid March and early May, and halt their northward migration with a prolonged stopover period in the province of Fryslân. During this period, the males moult into their exuberant breeding plumage. The males grow the conspicuous long, colourful ruffs and tufts, and develop a facial mask of brightly-coloured warts. We study these migrating Ruffs during their staging period in Fryslân. Our research questions are:

1. What is the size of the passage population using Fryslân and how does that relate to the global population size?
2. How long is the stopover period of an individual Ruff? And what habitats do Ruffs use whilst staging?
3. Where does the Frisian passage population breed? Is it confined to Western Europe or do parts of the population continue eastwards, and breed maybe as far as eastern Russia?
4. What is the annual survival and are there differences between males and females in survival?
5. Do Ruffs segregate into genetically distinguishable populations? The Ruff has a vast distribution range. Other waders with similar distributions in the arctic show genetic population structuring.
6. What is the reproductive strategy of the faeder? Ruff males come in three types: the dominant (independent) male, the satellite male and the faeder, a female mimic on which discovery we reported in the 2004 Newsletter.

In this newsletter we present a progress report for the last three years of research and we present our plans for the years ahead.

More information about our study area, methods and further details on results and discoveries can be found the 2004 Newsletter. This newsletter, and additional background information on our research is available at our website:

http://www.rug.nl/biologie/research/researchgroepen/dieroecologie/research/researchStudys/migratimmune

Colour-ringed birds, re-sightings and observers

In 2004, we started colour-ringing Ruffs passing through Southwest Fryslân. The Ruffs were caught with the help of the Friesian Wilsterflappers. This group of about 25 skilled and eager bird catchers provides the opportunity to issue colour-rings to a large number of Ruffs in just a few years. To date, more than 5000 Ruffs have been released; each with their own unique colour-ring combination. These colour-ringed birds have created a wave of re-sightings: we now have collected over 9500 re-sightings, from 400 different locations in 24 countries, reported by 615 observers.

Figure 1: Re-sighting locations of colour-ringed Ruffs as collected in the Ruff-project database from the University of Groningen

From all the colour-ringed Ruffs, about 60 % have been re-sighted. Many Ruffs have been reported just once (38 % of all re-sightings), but we have individuals with extremely high re-sight rates. An example is a male with the colour-combination R1WYBR (see Table 1 and picture below). Thanks to the effort of two British observers, this male has been re-sighted 91 times now! Obviously the majority of re-sightings have been collected in The Netherlands, but by now almost every country in Europe has been entered into our database with one or more observations. Reports from Africa and Russia are still very rare, but this is not unexpected, as the re-sighting probability in these countries is much lower.

In the map above we depict all re-sighting locations. The re-sightings show very clearly that Ruffs have two migration corridors through Europe (Fig. 1), with the western migration corridor having the highest density of re-sightings. This western corridor tracks over the Iberian Peninsula via western France, The Netherlands, and northern Germany, to Denmark, Sweden and Finland. The eastern corridor tracks south from the Alps towards Eastern Europe.

For many birds we now have re-sightings over several years, revealing remarkable patterns of site fidelity, during both spring and autumn migration and also in the winter. An example is that the re-sighting data disclosed unknown patterns in over-wintering behaviour, for example many (male) Ruffs consistently winter in northwestern Europe. It was known before that some males stayed in northwestern Europe during winter, but we observed that individual Ruffs repeatedly spent the winter in the north and did not migrate to Africa. In many cases, these Ruffs were not young and inexperienced, but adult males with high return rates. On a population level, this wintering behaviour probably comprises of a few thousand birds. As much as 16% of all our re-sighted Ruffs were seen at least once in the winter in northwestern Europe. They were staying, often for weeks on end, in Eastern England, Bretagne, Belgium (Bourgoyen near Gent), the Dutch Delta, Southwest Fryslân and on the island of Texel. We think that these northern winterers are the first to arrive in our study area in March, with the African over-winterers then arriving in early April. This pattern corroborated with a change in average wing length in the population around that time. It could be an adaptation to warmer winters, but we also think that the two groups might segregate towards different areas in the breeding range. We hope to reveal in the coming years exactly how the wintering and breeding areas connect and whether there indeed is a trend towards wintering in northern area!

Table 1: An abstract of all the 91 re-sightings on the male colour-ringed with R1WYBR

Colour combination: **R1WYBR** **Name Ringer:** Jaap Strikwerda

Ring number: 1485521 **Date caught:** 29-4-2005 **Catching location:** Oosterlittens, Skrins The Netherlands 53.07.23 N 05.38.55 E

Re-sightings for this Ruff:

Date	Location		Observer
22-6-2005	Vadsø, Ekkeroy		Marco Pavia
	Norway	70.04.50 N 30.05.27 E	
22-6-2005	Vadsø, Ekkeroy		Gert Rasmussen
	Norway	70.04.50 N 30.05.27 E	

***Table 1** (continued): an abstract of all the 91 re-sightings on the male colour-ringed R1WYBR*

Colour combination: ***R1WYBR*** ***Name Ringer:*** *Jaap Strikwerda*

Ring number: *1485521* ***Date caught:*** *29-4-2005* ***Catching location:*** *Oosterlittens, Skrins The Netherlands 53.07.23 N 05.38.55 E*

15-7-2005	Cley, Cley Marshes Nature Reserve United Kingdom 52.57 N 01.04 E	Peter Morrison
19-7-2005	Cley, Cley Marshes Nature Reserve United Kingdom 52.57 N 01.04 E	David and Pat Wileman
1-8-2005	Cley, Cley Marshes Nature Reserve United Kingdom 52.57 N 01.04 E	David and Pat Wileman
12-6-2006	Vadsø, Ekkeroy Norway 70.04.50 N 30.05.27 E	Jukka Könönen
13-6-2006	Vadsø, Ekkeroy Norway 70.04.50 N 30.05.27 E	François Bartholomeeusen
30-6-2006	Cley, Cley Marshes Nature Reserve United Kingdom 52.57 N 01.04 E	David and Pat Wileman
22-8-2006	Ousefleet, Blacktoft Sands United Kingdom 53.42.06 N 00.43.31 W	Roy Harvey
8-8-2007	Cley, Cley Marshes Nature Reserve United Kingdom 52.57 N 01.04 E	David and Pat Wileman
20-9-2007	Cley, Cley Marshes Nature Reserve United Kingdom 52.57 N 01.04 E	Ian Haynes
25-4-2008	Wommels, Skrok The Netherlands 53.06.43 N 05.36.06 E	Yvonne Verkuil
5-5-2008	Umeå, Ume River Delta Sweden 63.45 N 20.20 E	Henke Johansson

R1WYBR photographed on 13-06-2006 near Vadsø, Ekkeroy, Norway (Photo: François Bartholomeeusen).

Migration strategy and population size in southwestern Fryslân

To study patterns in the staging behaviour of Ruffs migrating through Fryslân, and to determine the proportion of the European population passing through our study area, we applied two methods: individual colour ringing and radio telemetry. We re-sighted a substantial number of the Ruffs several times whilst staging and with these repeated observations we can estimate the individual stopover duration and estimate population sizes (see BOX 1). Additionally, in 2005 and 2007 we applied radio transmitters to 48 and 47 respectively of the colour-ringed Ruffs (see BOX 2). With the radio telemetry data we wanted to calibrate the estimates of stopover duration obtained with the colour-ring data. The re-sighting probability is much higher for radio-tagged birds (70% versus 15% in colour-ringed birds) and hence we expected to get, for this small sub-sample of birds, a more reliable estimate of stopover duration.

BOX 1

To calculate how long an individual is staging in SW Fryslân, we could take the interval between the catching date and the last re-sighting. However, colour-ringed birds are not spotted every day, or in other words the re-sighting probability is not 100%. If we used this simple method we would underestimate the stopover duration. We therefore used a mark-recapture method (e.g. as applied in the software programs MARK and SODA). This method uses the re-sighting probability to estimate (1) the staying probability, the probability that a bird will stay to the next stopover day and (2) the probability that the bird was already present before the first observation, its seniority to the area. The staying probability and seniority together allow us to estimate the individual stopover duration time. To estimate the population size we apply the staying probability to the census counts. With the staying probability we estimated how many birds in the interval between counts have emigrated and we can then calculate how many birds in the next count must be new arrivals. We totalled up the new arrivals with the numbers counted in the first count of the season (assuming that all those were new arrivals). The sum represents the total passage population:

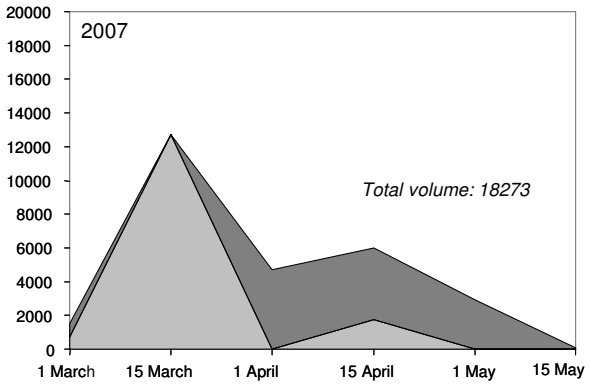


Figure 2: Population size as counted during census counts (sum light and dark grey) and the calculated number of new arrivals (light grey); example for 2007.

The staying probability for a radio-tagged Ruff was between 80-100% until mid April and then decreased slowly towards zero. The chance that a Ruff was already present before it was caught (its seniority) increased slowly to 100% around mid April. This means that until mid April there was hardly any emigration and after this point no immigration of new birds. Mid April seems to be the mid point in the season.

Do the observed differences in stopover duration result in variation of our estimates of the passage population? In 2006 we counted 17,222 Ruffs; in 2007 12,733 Ruffs; and in 2008 only 6.140 Ruffs. From the re-sighting encounter histories, we calculated that the stopover duration of a male Ruff was between 20 and 24 days (Table 2). However, Ruffs are seen in the area for 45 days (roughly between 15 March and 1 May), so we can already see that the passage population must be higher than the census counts. Assuming that the females have equal staging times, we used the formula in BOX 1 to calculate that in 2006 almost 19,000 Ruffs passed through the area; in 2007 over 18,000 and in 2008 almost 10,000. In 2006, we observed new arrivals until early April and only after that point did the birds start to depart. In 2007 and 2008, Ruffs seemed to leave sooner, from early April onward. In those years, we observed a small wave of new arrivals midway through April. There seems to be quite some variation in migratory patterns between years.

BOX 2

Radio telemetry allows us to locate an individual at quite a distance and on a regular basis. In 2005 and 2007 we issued radio transmitters of 1.8 g with a 10cm long antenna, to 95 adult male Ruffs with colour-rings. Nine automatic radio tracking stations (ARTS) then scanned continuously for the presence of the radio-tagged birds. The ARTS were installed at the most important roosts; seven were located along the coast of Lake IJsselmeer and two inland. Each station scanned 72 times per day for the frequency of each individual. Additionally handheld receivers were used to calibrate the ARTS registrations and to collect additional information on home range. All individuals, except Y6RYRB, were registered by an ARTS or an observer, although Y6RYRB's colour-rings were recorded on 7 April 2005 and on 25 March 2007. The annual survival of the Ruffs radio-tagged in 2005 was on average 88%. This means that correcting for the re-sighting probability, 88% of the birds returned after 2005. This survival rate is quite high and indicates no negative effects of the radio-tagging.

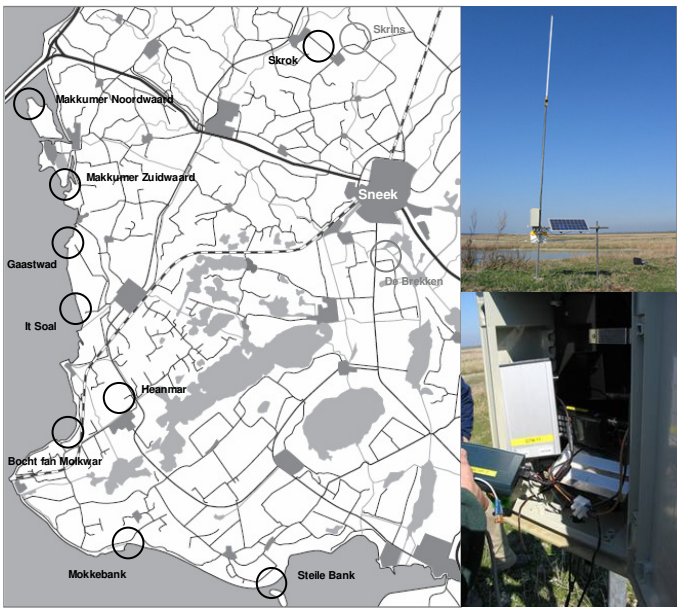


Figure 3: Location of the important roosting sites in Southwest Fryslân. These roosts were equipped with an automatic radio tracking station (ARTS), indicated by the black circles. The smaller roosts are indicated in grey. The ARTS were solar powered.

In conclusion

Male Ruffs stage in Southwest Fryslân for prolonged periods during spring migration: around three weeks. Ruffs do not gain body mass at a very high rate in comparison to other waders on migration, but in the staging period they grow almost a full summer plumage; an impressively intense moult that might explain the long stopover duration. The quality of Fryslân as a staging destination might be due to the combination of agricultural fields with good prey densities and/or high quality prey, and the vicinity of safe and suitable roosts. Our estimates of the passage population size show that Fryslân is a staging area of international importance: in spring it harbours so many Ruffs that it would equal 4-10% of the European breeding population. One should bear in mind that our estimates are based on male Ruffs staging behaviour only. If the females, who migrate through during the second half of April, have a substantially shorter staging time we might underestimate the passage population. We want to thank the Schure Beijerinck Popping Foundation for subsidising the logistic costs of the colour-ring program. The technical and logistic costs of the radio telemetry study were financed by the GUF/Gratama Foundation.

Table 2: The stopover duration of male Ruffs staging in Southwest Fryslân during spring migration. The estimates for colour-ringed Ruffs were obtained with the software programs MARK and SODA. To estimate the total stopover duration we estimated both the (1) *re-sighting probability*, (2) *staying probability*, that is the chance that a Ruffs will stay in the area after the last registration, and (3) the seniority, the probability that a Ruff was present before the first observation. In 2004 and 2005 the colour-ringed population and re-sighting rates were too small to yield reliable estimates. For the radio-tagged Ruffs, we reported the minimum staging time, which is the time between first and last re-sighting days for Ruffs tagged before 2nd April.

Year	Total stopover duration colour-ringed male Ruffs	Minimum stopover duration radio-tagged male Ruffs
2005	-	24.2 (± 8.7)
2006	24.4 (± 3.5)	-
2007	22.4 (± 3.9)	19.2 (± 11.3)
2008	19.9 (± 3.1)	-

Ruffs are stuck in a hard place

It is well known that it seems only a matter of time before Ruffs disappear as a breeding bird inThe Netherlands. Though to our surprise, we also observed a strong decline in the passage population size during our study period (about -60%). That the large numbers of migrating Ruffs might also disappear from the Dutch meadows came as a surprise to us and the long-term counts in Southwest Fryslân confirm the short-term trend. In the nineties the Ruff disappeared from the inland areas of Fryslân, but near the coast of Lake IJsselmeer Ruffs remained the most numerous wader species on spring migration. The roost counts, performed in a standardised way

since 1996, reveal a decline in peak staging numbers from ca. 35.000 to 6000 birds in 12 years (Fig. 4). However, peak staging numbers might be strongly underestimating the real passage population size when the turnover rate is high. We therefore need to correct these peak count numbers (black line in Fig. 4) for individual stopover time. We showed before that the turnover is limited as individual stopover duration is quite long, being ca. three weeks. When we estimate the staging time corrected for turnover using the colour-ring data, we do indeed see a difference between the peak counts and the passage population, but still observe a decline in staging numbers of Ruffs (grey line in Fig. 4).

This decline seems to be stronger later in the season. We compared the phenology from before 2004 with the phenology after 2004, and observed that in March the average staging numbers are 4% lower in the later years. In the second half of April and in early May this difference between early and later years increases to as much as 75% (Fig. 5). What seems to happen is that Ruffs increasingly avoid the western migration corridor, and are shifting towards the eastern route as depicted on the map we presented at the beginning of this newsletter (Fig. 1).

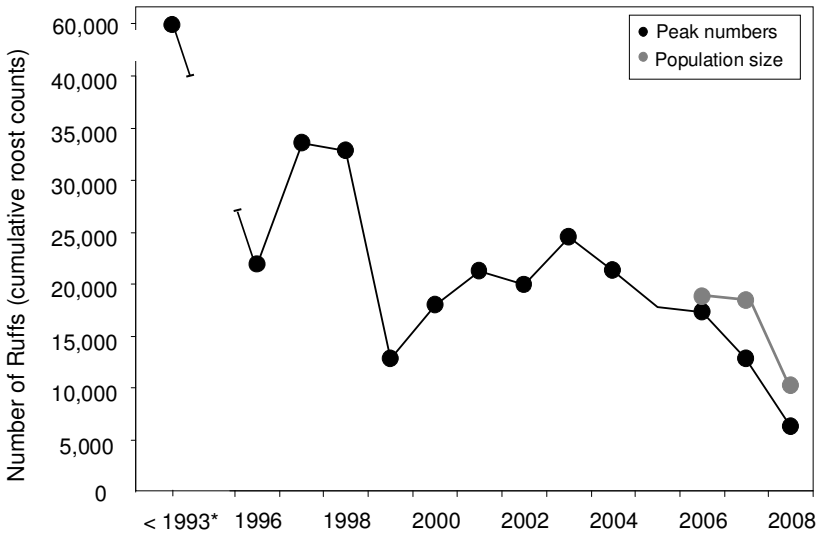


Figure 4: The peak counts and estimated passage population size of Ruffs, as counted on roosts near the Frisian coast of Lake IJsselmeer.

We have several lines of evidence for this eastward shift. The number of re-sightings from Southern and Eastern Europe has increased significantly in the last two years. In 2008 we received the first reports of colour-ringed Ruffs from as far east as Belarus. In Belarus, in the Pripyat River flood plains near Turov, Gomel Region (52.04 N 27.44 E), Natalia Karlionova and Pavel Pinchuk have monitored their passage population of Ruffs in detail since 2001. Their census counts and the catches show a strong increase in staging numbers in Belarus, especially in 2007 and 2008, when we in Fryslân experienced the strongest decline (Fig. 4). In the last two years, the phenology has shifted forwards in Belarus; the Pripyat delta has now more migrants in the second half of April, exactly the period when our migrating Ruffs are missing in The Netherlands!

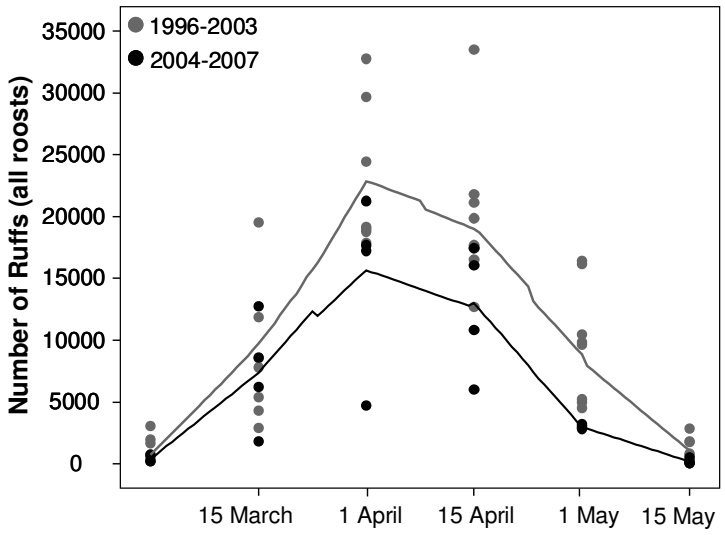


Figure 5: Cumulative peak counts at nine important roosts along the Frisian coast of Lake IJsselmeer, between 1996-2003 and between 2004-2007.

In Fryslân, we observed slightly lower body mass increases and lower departure body masses. In particular, the moult and the development of the facial mask of warts were much slower in recent years. In the same period in Belarus, the rate of accumulating body mass has increased. This suggests that environmental changes in The Netherlands might partly explain the decline and shift eastwards. Nonetheless, this is only one part of a bigger picture. We also compiled a review of published and unpublished data from the breeding areas. Throughout the range, from Scandinavia via Poland to as far east as central Russia, the data showed strong to moderate declines in breeding densities (for an example see Fig. 6). This might be related to habitat destruction. In Eastern Europe and Russia, many large agricultural communities have disappeared and have been replaced by more intensive forms of agriculture. However, in the relatively undisturbed northern tundra's of western Russia Ruffs also seem to be in decline. Only the far eastern part of the range is unaffected. This indicates not only agricultural land use changes in the breeding areas but that other additional factors are influencing population sizes. One of these factors could be the hunting pressure in the wintering areas in the Sahel in West Africa.

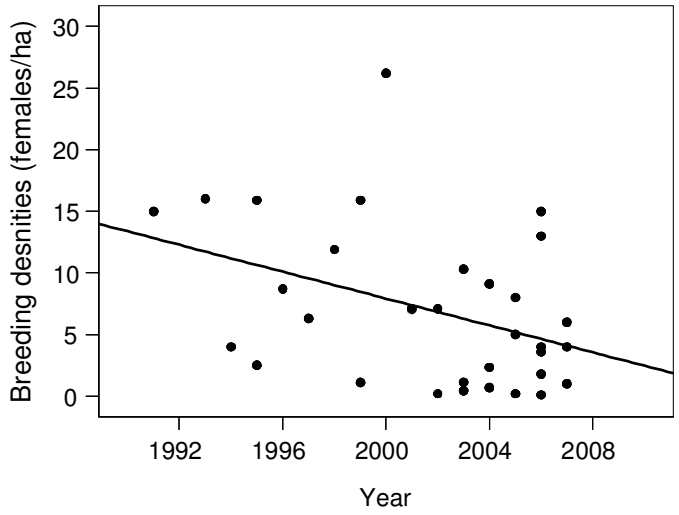


Figure 6: Densities of breeding female Ruffs in Russia.

Sex ratio and home ranges

The timing of migration of male and female Ruffs is quite different (see Fig. 7). Early in the season there are hardly any females at the migratory stopover site. The proportion of females starts to increase later in April, and only in early May are females and males present in equal proportions. However, by then the staging numbers are very low, as most males have left already in May. This implies that the total number of females using the area is probably much lower than the number of males. We could test this by comparing the stopover duration of females with males, but the re-sighting data on colour-ringed females is still too scarce to do the calculations.

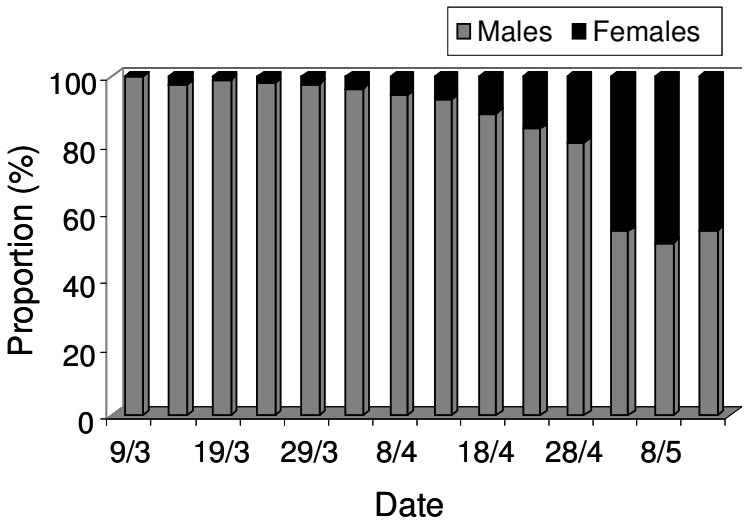
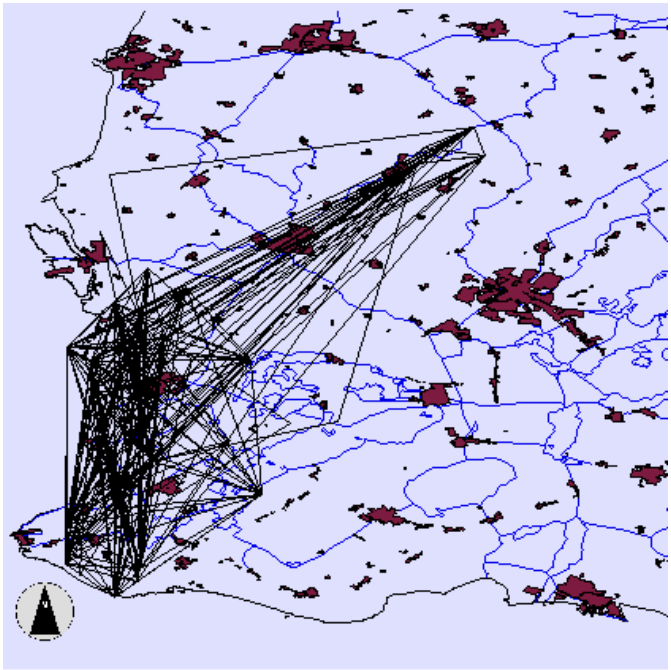


Figure 7: Proportion of males and females in roosting and foraging groups of Ruffs in Southwest Fryslân.

To estimate the average size of a Ruff's home range, we analysed the distribution of individual re-sightings throughout the study area. The home ranges turned out to be rather small with most male and female Ruffs seen within 2.5 km of the nearest roost oftenshowing strong site fidelity to particular foraging areas. On average the home ranges were 3 to 7 $km^{2,}$ with most birds foraging close to the roosts. The home ranges seem to get extended towards the northeast later in the season.



We assume that this reflects the start of the northern migration towards the breeding areas. In Figure 8 an overview of a number of overlapping home ranges is displayed. This clearly shows that most colour-ringed birds tend to concentrate in what we call the core of our study area in southwest Fryslân. The lines towards the northeast indicate emigration towards two roosts called Skrok and Skrins, which seem to function as a springboard for northward migration.

Figure 8: Home ranges of Ruffs in Southwest Fryslân.

Reconstructing migration and breeding dispersion from the genetic code

Now that the re-sightings of Ruffs are streaming in from all over Europe, we are getting a better understanding of the flyways of 'our' birds. However, we still do not know which breeding areas the Ruffs migrating through The Netherlands are heading for. The breeding areas, especially those in Siberia, are too remote and we simply do not get enough re-sightings from them. Also we do not know whether individuals skipping a stopover in The Netherlands, are just missed (the re-sighting probability is never 100% of course) or are actually taking another route that year. Even if we could gather very detailed information for a few individuals, it does not tell us how general the behaviour of those few Ruffs is. We still would not know how site faithful Ruffs are on average: does a Ruff go to the same breeding areas every year or does it tend to wander around?

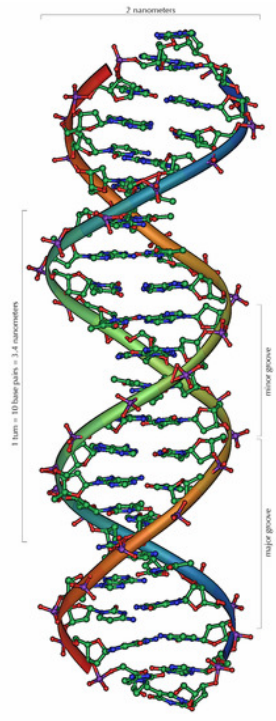


Figure 9: The structure of DNA is a double helix. The two strands join where the DNA base-pairs (A, C, T, G, the small appendices on the skeleton) come together.

To solve the questions raised above we will apply a technique very different from colour ringing, something resembling genetic fingerprinting (commonly used in forensics, as anybody watching CSI may be familiar with). For each bird we colour-ringed so far, a small blood sample has been taken to isolate DNA. DNA is the hereditary material and the way birds migrate and disperse between breeding areas leaves a blueprint in the DNA. This works as follows. In parts of the DNA that do not encode for important traits (sometimes called junk-DNA) all kinds of small mutations pile up which may be inherited by the following generations without causing any damage. To explain it in more detail: DNA is built from a four digit code: A, C, T, G (see Fig. 9 and http://en.wikipedia.org/wiki/DNA),for example the code: GAATTCTAAC GGTCCCGAAA CTCTGTGCGG TGCTGAACTG GTTGACGCTC etc. encodes for insulin. In this code no errors are allowed otherwise we would not be able to process the sugars in our diet. So this code is very conservative, it has to remain the same. But a little further down on the DNA strand may sit a piece of DNA which reads as:

ACACACACACACACACACAC (=10AC)

In bird DNA you find a variety of this so-called 'junk DNA' which contain different tandem repeats, also called microsatellites. Beside the above given AC microsatellite, there are also AG microsatellites and ACAAC microsatellites (and other alternatives we will not discuss here). What this kind of DNA exactly does is unknown, but we do know that it does not alter the functioning of the bird whether it reads 10, 7, or 12 times AC. So in the course of generations several 'alleles', that is number of repeats, will evolve. Now we can look at how many repeats an individual

has on their microsatellites. Ruff '1' is a female breeding on Gotland in Sweden. Her genetic blueprint or genotype is:

10AC, 22AG and 10ACAAC.

Ruff '2' breeds in Finland. Her genotype is:

10AC, 22AG and 12ACAAC.

Ruffs '1' and '2' have almost identical genotypes, but not entirely. Ruff '2' has inherited a 12ACAAC instead of 10ACAAC from her ancestors. What does that mean? Between Gotland and Finland there seems to be an exchange of breeding birds, for this reason the AC and AG microsatellites are alike: the DNA of the two breeding populations has been mixed in the recent past or is still getting mixed. The fact that the ACAAC microsatellite is different shows us that the mixing is not complete: every generation a few birds disperse between the breeding areas. So reading the 'genes' of our Ruffs teaches us that they fly back and forth between breeding areas and we can even calculate how many birds per generation do so! The next step is now to get hold of more blood samples from Siberian Ruffs. If we succeed, we will be able to report in the next Newsletter whether or not Ruffs are real cosmopolitans, even flying back and forth between Scandinavia and Siberia. It would also explain to us what has disappeared with the extinction of breeding Ruffs in the Netherlands: part of the western European subspecies or 'only' part of the world-wide breeding population?

The molecular-genetics of the Ruff project are carried out in co-operation with Prof. dr. Allan J. Baker and Oliver Haddrath from the Department of Natural History of the Royal Ontario Museum in Toronto, Canada.

Faeders are supermen

In the last newsletter, we reported that Joop Jukema and Theunis Piersma had discovered a new male type in Ruffs. This small male, which was named 'faeder', very much resembles a female and in spring it does not develop ruffs and tufts but retains the inconspicuous pre-nuptial plumage. This makes it virtually indistinguishable from females like in many other waders where the sexes are very alike. The display behaviour and reproductive strategies of the abundantly ornamented dominant males and the sub-dominant satellites has been described in detail by A. Hogan-Warburg, Johan van Rhijn, a handful of Swedish researchers (e.g. Fredrik Widemo) and the Canadian David Lank. But since the faeder is also cryptic for the human eye, its reproductive behaviour has never been observed. It even remained unclear for a while whether faeders were fertile at all. Since this last report we have continued our studies of the faeder: (1) we observed faeders on an artificial lek in a large enclosure at the Royal Netherlands Institute of Sea Research (NIOZ) on the island Texel.; (2) two faeders were flown over to Vancouver (Canada) to be introduced in the captive colony maintained for many years now by David Lank; (3) we looked into the long-term catching data of other researchers in England, Belarus and Senegal to establish occurrence of faeders in other areas; and (4) we dissected a few faeders. We have made some exciting discoveries from these!

Figure 10: Differences in plumage between males, females and faeders. A faeder (top right; photo R. Chandler) very much resembles a female (bottom right), but there are little differences. The breeding feathers of faeders are a little more striped and faeders are slightly larger and bulkier than females.

Faeders played an active role on the leks of both colonies. Both on Texel and in Vancouver, faeders had the tendency to stay in close proximity to the displaying males, and in both situations, this resulted in regular male-male copulations. On Texel, we saw in total 177 mountings of faeders and males (and vice versa) and only 21 mountings of females by males. On Texel, the Ruffs were only held in captivity for a few weeks and the females did not adapt very

quickly to the captive conditions and henceforth were not very willing to copulate. In Vancouver, females did actively solicited copulations, and often preferred copulations with faeders above copulations with regular males.

Faeders seem popular to both the males and the females. Why would that be? The function of the homosexual copulations could be to attract females to the lek, which would be the equivalent of the dance of the dominant male and the satellite. David Lank hypothesised that faeders are not sneakers who steal copulations but that they imitate females to cuckold males. In Vancouver they indeed actively tried to direct males away from the receptive females. Despite their small size, faeders turned out to be super males. Their testes are 2.5 times larger than testes of normal males. This indicates that in a natural situation they do not get many opportunities to copulate. If they do get an opportunity to copulate, they will utilise their augmented size to ensure a large volume of ejaculate.

The most exciting achievement of the faeders is that in the Vancouver colony they fathered as many as 29 chicks! We now know for sure that faeders can reproduce. Last year, the offspring of the faeders reached adulthood and the males amongst them are partly faeders! Normal males did not produce any faeders. This supports the idea that a specific gene or a set of genes is coding for male type. As yet we do not understand why faeders are so popular by the females.

Faeders are female look-alikes (Fig. 10). The smaller females (reeves) over-winter more southerly than males; reeves prefer wetter habitats and migrate later to the breeding areas. We expected that outside the breeding season, faeders would behave more like females than like males. We could test this because a number of foreign researchers shared their catching data with us. Faeders have a wing length between 170 and 180 mm. Using this size measure to assign male types, we could calculate the proportion of faeders in catches made in England, Belarus, Senegal and The Netherlands and compare those with the proportion males and females in the catches. There seem to be very few faeders, ca. 1%, and if there were more males in catches there were also more faeders. Apparently faeders prefer to associate with the other males outside breeding season, maybe to keep an eye on them. Relative to their size, they winter and staged in sub-optimal habitats: a behaviour that might get compensated with a higher reproductive success.

R8RRYR is back again on the Workumerwaard, Fryslân, The Netherlands in March 2009 (Photo: Feike van der Leij).

Contact

If you have questions after reading this Newsletter, do not hesitate to contact us. We want to thank you and all the other people who have contributed to our study and we hope to continue the fruitful co-operation!

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…….and all the Frisian bird catchers!

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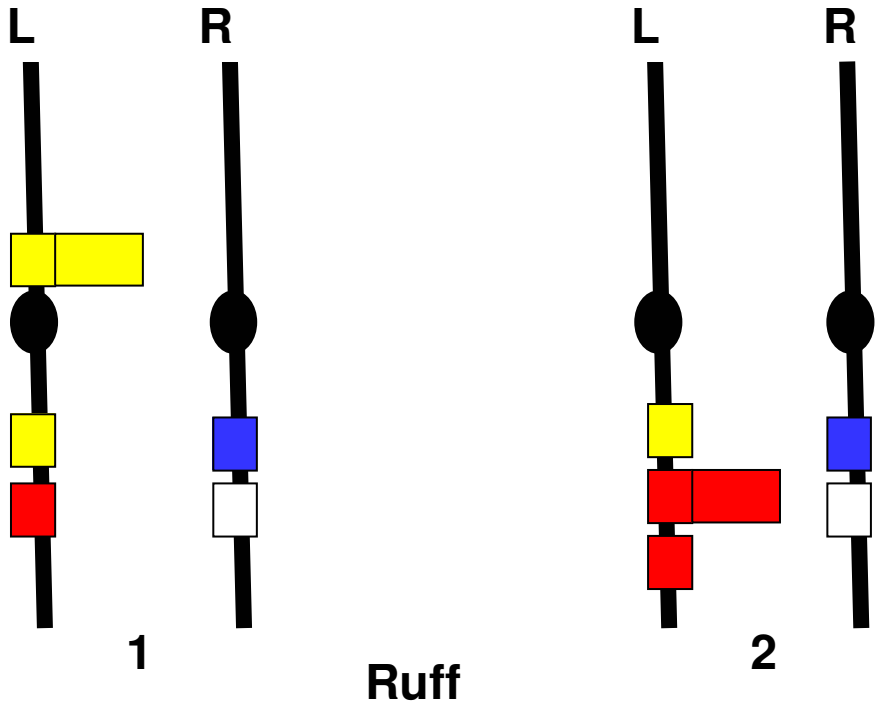

Colour-ring scheme for Ruffs

Each bird has a flag (on the tibia or tarsus) and 4 colour bands (2 per tarsus).
Used colours: yellow, red, blue and white.
Position of the metal ring is not part of the code.