

Science for Environment Policy

Intensive agriculture is changing migratory route for birds

New research suggests that many Ruffs are changing their migratory route when flying north to their breeding grounds in northern Europe and to Asia from Africa. This is because their food supply has been reduced by the effects of intensive agriculture in the Netherlands, where they commonly stop off, causing them to shift eastwards to stopping-off points in Eastern Europe instead.

The Afro-Eurasian Ruff (*Philomachus pugnax*) is a common inland shorebird that typically migrates along well-defined routes from sub-Saharan Africa, stopping off along the way at specific sites to rest, feed, build up fat reserves and, for most males, develop their breeding plumage. Ruffs follow two major routes: a pathway from Western Europe to the northern European and European Arctic breeding grounds, and a pathway from Eastern Europe to Western and Central Siberia.

The stop-off points, or 'staging areas', are in the intensively-managed dairy grasslands in Friesland, the Netherlands for the westerly route; and in the managed floodplain meadows of Pripyat, Belarus and the lagoons at Sivash, Ukraine, for the easterly route. However, in recent years, the number of Ruffs stopping in the Netherlands has fallen significantly, while numbers stopping in Belarus have increased. Previous research has also found a large-scale shift of Ruffs from the European to the Asian part of the Arctic breeding grounds.

To explore the effects of habitat change on the birds' migratory routes, the researchers compared: the size of migratory populations in the Dutch and Belarusian staging areas, the length of stay, based on sightings of individuals tagged with metal rings, coloured tagging and radio-tagged male birds, and the average rate of increase in body size for the period 2001 to 2010.

Between the spring of 2001 and spring 2010, the number of Ruffs stopping in the Dutch study area fell by 66%, from 19,200 in 2001, to less than 4000 in 2010. During the same period, the number of birds stopping in the Belarusian staging site increased by 12,000. The time the birds spent at the Dutch staging area dropped from an average of 23 days in 2005, to 19 days in 2008. Furthermore, the average weight gained by individuals in the Dutch study area between 2001 and 2010 declined by 43% in males and 71% in females, but weight gain remained stable at the staging area in Belarus.

Since 2008, three Ruffs that were ringed in Friesland (and two from Sweden) were recaptured in Pripyat, whereas no birds had been recovered in Pripyat that had been ringed in Western Europe before 2008. However, this is a small sample size from which to draw conclusions. In addition, the number of resightings of colour-tagged Ruffs from Friesland in Western Europe decreased, whereas the number of resightings, in Central and Eastern Europe increased, suggesting that, despite a small sample size, the birds had relocated from the western to eastern flyway.

Ruffs search the ground with their beak for insects and other invertebrates to eat. Therefore, changes in land management in the Friesland grasslands of the Netherlands, such as increased intensive agriculture, which includes frequent tillage, monoculture pasture cultivation, and drainage (which dries out the grasslands), could reduce the availability of soil invertebrate food for the birds. According to the researchers, the most likely explanation for the declining length of stay and reduced weight gained at the Friesland staging site is the deteriorating quality of the staging habitat there, and it appears that migratory birds have shifted further east to avoid this area. They suggest that raising the water tables in Friesland would help earthworms, for example, flourish in wetter grasslands and provide sufficient food for the ruffs.

Although Ruffs appear to be able to shift migratory routes, environmental changes, such as habitat degradation and loss, can seriously affect other migrant bird populations.



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