

Key Habitats for Declining Migrant Birds in the West African Sahel

- Many birds that undertake long-range migrations between Europe and Africa are declining in numbers.
- The reasons for this decline are unknown, but may include land use changes in the Sahel, resulting both from climate change and the way rural land is managed.
- Farmland, grassland and woodland are all important wintering and staging habitats for migrant birds. The presence and density of trees and shrubs is likely to be particularly important.
- Knowledge of the habitat requirements of migrant birds is essential to understand the implications of climate and land use change in the Sahel.

Over 2 billion songbirds that breed in Europe spend the winter in Africa, many of them in the semi-arid farmlands, grassland and woodlands of the Sahel and Sudan-Guinea zones south of the Sahara¹. Many of these species are declining in Europe². These declines are more pronounced than those of both short-distance migrants and species that are European residents.

Birds migrate from breeding sites in European woodlands, farmlands and wetlands to sub-Saharan wintering grounds by different routes. The relative importance of the different threats that they face on their journey are poorly understood, but there is particular concern about the impacts of climate and land use change in the Sahel in West Africa.

The habitat requirements of migrant birds in the Sahel are not well understood. This research note reports work to identify the relative importance of Sahelian habitats in terms of the number of migrant species they support.

Habitats and Birds

The Sahel is a semi-arid zone of farm and grazing land south of the Sahara Desert. Its long-term (50 year) mean rainfall is 200-600mm per year. Sahel habitat types range from open grasslands and seasonally cultivated fields through various mixtures of grassland or crops with scrub or trees, to woodland and seasonal wetlands³.

All these habitats are important for migratory birds⁴. The relative value of different habitats to 68 species that winter in the western Sahel (from Senegal to Niger), were assessed at a workshop held in 2011. Seventeen habitat types were scored in terms of their importance⁵.

The habitats of greatest importance (scores 8-10) are shown in Table 1. Habitats of medium importance (scores



Key Sahelian Habitats

(clockwise from top right) Cattle in a seasonal wetland in northern Nigeria; Millet field in the Sahel zone of northern Nigeria; Farmed parkland near Kano, northern Nigeria; Livestock manure ready for spreading, near Kano, northern Nigeria

5-7) were: farmland, shrubland, wet grassland and wetland fringing vegetation. Habitats of low importance (Scores 1-4) were rocks, built up areas (villages or towns), grassland, irrigated farmland, wetland emergent vegetation and open water⁶.

Habitats and declining species

Not all birds migrating from Europe to the Sahel have declined at the same time. Rainfall was low 1970-1990, and drought caused severe declines in several species, including a 70% crash Common Whitethroat in 1969⁷. Rainfall was still variable but the Sahel was less dry 1990-2000, and the relationship between rainfall and winter survival was less evident (e.g. White Stork and Sedge Warbler)⁸. The most

Table 1 - Important Bird Habitats in the Sahel

Habitat	Description	Typical species
Farmland with shrubs	Open land dominated by annual or perennial crops, with a 10-40% cover of shrubs or bushes 2-7m tall	White Stork, Montagu's Harrier, Turtle Dove, Woodchat Shrike, Northern Wheatear
Grassland with shrubs	Dominated by grasses and herbs, with a 10-40% cover of shrubs or bushes 2-7m tall	White Stork, Tawny Pipit, Greater Short-toed Lark, Northern Wheatear, Isabelline Wheatear
Farmland with trees	Open land dominated by annual or perennial crops, with a 10-40% canopy cover of woody plants >8 m tall	European Scops Owl, Hoopoe, Tree Pipit, Willow Warbler, Subalpine Warbler, Spotted Flycatcher
Grassland with trees	Dominated by grasses and herbs, with a 10-40% canopy cover of woody plants >8 m tall	Spotted Flycatcher, Hoopoe, Tree Pipit, Willow Warbler, Woodchat Shrike, Northern Wheatear
Shrubland with trees	Open stands of shrubs or bushes 2-7m tall (>40% cover) and a 10-40% canopy cover of woody plants >8 m tall	Rufous Scrub Robin, Common Nightingale, Whitethroat, Garden Warbler, Willow Warbler
Open woodland	An open stand of trees at least 8m tall with a canopy cover of 40% or more, the field layer usually dominated by grasses	Hoopoe, Black-eared Wheatear, Common Redstart, Lesser Whitethroat, Subalpine Warbler
Wet woodland	A continuous stand of trees at least 8m tall along seasonal or permanent rivers or lakes	Turtle Dove, Pied Flycatcher, Subalpine Warbler, Western Bonelli's Warbler, Iberian Chiffchaff,

recent declines in migrants are among species associated with European woodlands in summer and more humid wooded habitats south of the Sahel in winter⁹.

To explore the relative importance of different habitats to declines at different periods, scores were compared for declining and non-declining species in two time periods: 1970-1990 and 1990-2000¹⁰.

In both periods, the birds whose numbers declined were particularly associated with farmland and grassland with trees, while land birds associated with fringing vegetation around bodies of water did not seem to decline, suggesting that despite the drought these habitats continued to support those species wintering in them.

In the earlier drier period (1970-1990), birds associated with open farmland and grassland also declined, perhaps because such habitats were most impacted by low rainfall. In the later period (1990-2000), other factors such as scrub or woodland clearance may have been more important.

Conclusions

The causes of decline in African-Eurasian migrant birds remain poorly understood. Rainfall is variable within and between years, but change in frequency, amplitude and variability of rainfall are likely to have negative impacts on migrant birds that winter or stage in the Sahel. Changes in land cover in the Sahel, particularly the loss of trees and shrubs in open farmland and grassland, are likely to be detrimental to many migrant birds.

Better knowledge of the habitat requirements of migrant birds in the Sahel is necessary if we are to understand the significance of climatic and land use change in this region for birds, or to address their decline.

¹ Hahn, S., Bauer, S. & Liechti, F. (2009) 'The natural link between Europe and Africa: 2.1 billion birds on migration' *Oikos*, 118 624-626.

² Sanderson, F.J., et al. (2006) Long-term population declines in Afro-Palaearctic migrant birds. *Biological Conservation* 131, 93-105; Heldbjerg, H., Fox, A.D. 2008. Long-term population declines in Danish trans-Saharan migrant birds. *Bird Study* 53, 267-279

³ Raynaut, C., with E. Grégoire, P. Janin, J. Koechlin and P.L. Delville (1998) *Societies and Nature in the Sahel*, Routledge, London; Mortimore, M. (1998) *Roots in the African Dust: sustaining the subSaharan drylands*, Cambridge University Press, Cambridge.

⁴ Zwarts, L., et al. (2009) *Living on the edge: Wetlands and birds in a changing Sahel*. KNNV Publishing.

⁵ The sum of species scores for each habitat were then expressed as a percentage of total scores across all habitats. Results shown here use unstandardised scores.

⁶ Atkinson, P.W. et al. (unpublished) 'Identifying key wintering habitats in the Sahel for declining African-Palaearctic migrants'

⁷ Winstanley, D., Spencer, R., Williams, K. (1974) Where have all the Whitethroats gone? *Bird Study* 21, 1-14.

⁸ Nevoux, M., et al. (2008) Nonlinear impact of climate on survival in a migratory white stork population. *Journal of Animal Ecology* 77, 1143-115

⁹ Hewson, C.M. & Noble, D.G. (2009) 'Population trends of breeding birds in British woodlands over a 32-year period: relationships with food, habitat and migratory behaviour', *Ibis* 151: 464-486.

¹⁰ Here scores were weighted to increase the importance of a habitat when it was one of only a few the species used and decrease its importance when it was one of many used, see Atkinson et al. (unpublished) (note 6).