Key Habitats for Declining Migrant Birds in the West African Sahel

Introduction
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 Sahara. Many of these species are declining in Europe. 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 wetlands. All these habitats are important for migratory birds. To assess the relative value of different habitats to 68 species that winter in the western Sahel (from Senegal to Niger), we reviewed published literature and invited experienced researchers to a workshop to score 17 habitat types in terms of their importance.

- Many birds that undertake long-range migrations between Europe and Africa are declining in numbers. The Sahel is a key wintering region and staging area for these birds.
- The reasons for this decline are unknown, but may include land use changes in the Sahel, resulting both from climate change and rural land management.
- A synthesis of existing knowledge and expert opinion suggests the habitats of greatest importance for these migrants are farmland and grassland with shrubs or trees, areas of shrubs and trees, and woodland.
- The loss of trees and shrubs in grassland, farmland and woodland is likely to be detrimental for many land birds migrating from the Sahel to Europe.
- Knowledge of the habitat requirements of migrant birds is essential to understand the implications of climate and land use change in the Sahel.

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

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 1969. Rainfall was still variable but the Sahel was less dry 1990-2000, and the
Typical species

Dominated by grasses and herbs, with a canopy cover of woody plants >8 m tall

Greater Short-toed Lark, Ortolan Bunting, Northern Wheatear, White Stork, Spectacled Warbler

Dominated by grasses and herbs, with 10-40% cover of open stands of shrubs or bushes 2-7 m tall

Tawny Pipit, Greater Short-toed Lark, Northern Wheatear, Whinchat, White Stork, Isabelline Wheatear

Open land dominated by annual or perennial crops, with a canopy cover of woody plants >8 m tall of 10-40%

Spotted Flycatcher, Hoopoe, Tree Pipit, Willow Warbler, European Scops Owl, Subalpine Warbler

Dominated by grasses and herbs, with a canopy cover of woody plants >8 m tall of 10-40%

Spotted Flycatcher, Hoopoe, Tree Pipit, Willow Warbler, Subalpine Warbler, Melodious Warbler, Iberian Chiffchaff, Common Chiffchaff

Spotted Flycatcher, Willow Warbler, PIED FLYCATCHER, Subalpine Warbler, Melodious Warbler

An open stand of trees at least 8 m tall with a canopy cover of 40% or more, the field layer usually dominated by grasses

Pied Flycatcher, Icterine Warbler, Common Redstart, Olivaceous Warbler, Lesser Whitethroat, Subalpine Warbler

A continuous stand of trees at least 8 m tall along seasonal or permanent rivers or lakes, with interlocking crowns

Pied Flycatcher, Icterine Warbler, Common Redstart, Subalpine Warbler, Iberian Chiffchaff, Melodious Warbler, Common Chiffchaff

Table 1 - Important Bird Habitats in the Sahel

Habitat | Description | Typical species
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Farmland with shrubs | Open land dominated by annual or perennial crops, with 10-40% cover of open stands of shrubs or bushes 2-7 m tall | Greater Short-toed Lark, Ortolan Bunting, Northern Wheatear, White Stork, Spectacled Warbler

Grassland with shrubs | Dominated by grasses and herbs, with 10-40% cover of open stands of shrubs or bushes 2-7 m tall | Tawny Pipit, Greater Short-toed Lark, Northern Wheatear, Whinchat, White Stork, Isabelline Wheatear

Farmland with trees | Open land dominated by annual or perennial crops, with a canopy cover of woody plants >8 m tall of 10-40% | Spotted Flycatcher, Hoopoe, Tree Pipit, Willow Warbler, European Scops Owl, Subalpine Warbler

Grassland with trees | Dominated by grasses and herbs, with a canopy cover of woody plants >8 m tall of 10-40% | Spotted Flycatcher, Hoopoe, Tree Pipit, Willow Warbler, Subalpine Warbler, Melodious Warbler, Iberian Chiffchaff, Common Chiffchaff

Shrubland with trees | Open stands of shrubs or bushes 2-7 m tall (>40% cover) and a canopy cover of woody plants >8 m tall of 10-40% | Spotted Flycatcher, Willow Warbler, PIED FLYCATCHER, Subalpine Warbler, Melodious Warbler

Open woodland | An open stand of trees at least 8 m tall with a canopy cover of 40% or more, the field layer usually dominated by grasses | Pied Flycatcher, Icterine Warbler, Common Redstart, Olivaceous Warbler, Lesser Whitethroat, Subalpine Warbler

Wet woodland | A continuous stand of trees at least 8 m tall along seasonal or permanent rivers or lakes, with interlocking crowns | Pied Flycatcher, Icterine Warbler, Common Redstart, Subalpine Warbler, Iberian Chiffchaff, Melodious Warbler, Common Chiffchaff

relationship between rainfall and winter survival was less evident (e.g. White Stork and Sedge Warbler). The most recent declines in migrants are among species associated with European woodlands in summer and more humid wooded habitats south of the Sahel in winter.

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 1990-2000.

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.


5. Scores were weighted so that the total score for each species (across all habitats where it occurred) summed to 1. The sum of species scores for each habitat were then expressed as a percentage of total scores.


10. The summed scores were then weighted in such a way as 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.