European Commission

Science for Environment Policy

Wetland biodiversity is supported by temporary flooding and sustainable grazing

The preferred habitats of wetland bird species - including 12 that are endangered - have been identified by a new study. From conducting counts at 137 sites across Sweden, it was found that total species richness was highest in sites that had a tendency to flood; wet grassland areas that were grazed as opposed to mowed; and sites that were far from areas of woodland. The authors suggest this research could help determine the most suitable locations for future wetland conservation projects.

11 February 2016
Issue 446

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Source: Żmihorski, M., Pärt, T., Gustafson, T. & Berg, A. (2015). *Effects of water level and grassland management on alpha and beta diversity of birds in restored wetlands*. Journal of Applied Ecology. DOI: 10.1111/1365-2664.12588

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As well as supporting a diverse array of wildlife, wetlands provide important ecosystem services. Although they account for less than 9% of land across the world, they contribute approximately 40% of global environmental services, including water supplies, nutrient retention, flood mitigation from populated areas and recreational uses. However, the proportion of wetland areas has decreased dramatically over the past century, predominantly due to draining for agriculture. As a result, 40% of bird species that breed in wetlands have declined in the last 30 years. However, few studies have investigated how the qualities of wetlands and grassland management techniques may influence these bird populations.

Over the course of four years, the researchers monitored bird species at 137 restored wet grassland sites across south-central Sweden. Each site was the same size (3.1 ha) but they could be distinguished based on whether they were grazed, mowed, or unmanaged, had areas with low vegetation or open water and if there were small areas of arable land. The characteristics of the surrounding landscape were also identified for each site. Visits to the sites were conducted during the breeding season, where bird species were identified and counted and the wetness of the site was assessed on a scale from low to high.

Of the 38 species that were recorded across all sites, 12 of them were on the 2010 Red List of Swedish species. These included the white stork *(Ciconia ciconia),* which was earlier regionally extinct, and the black-tailed godwit *(Limosa limosa)*, which is critically endangered. The most commonly sighted species were the yellow wagtail (*Motacilla flava*) and the northern lapwing *(Vanellus vanellus*).

Areas that were subject to temporary flooding showed a significant increase in avian biodiversity. At sites that were flooded or that were found to have no dry spells over a long term – an overall 'basic wetness' – grazed land supported a richer overall diversity of bird species than mowed land. This is possibly because grazing creates a more diverse landscape, with some areas of long and short vegetation, some areas covered by grass or bushes and other areas of exposed earth due to trampling.

At all sites, proximity to woodland negatively affected the diversity of grassland and wetland bird species. An increase of just 10% in the proportion of forest within 250 metres of wetland sites reduced numbers of redshank (*Tringa totanus*) by 81% and yellow wagtails (*Motacilla flava*) by 66%. This is likely because forest areas provide lookouts for avian predators.

Given these results, the authors suggest that areas that are prone to flooding or have a moderate to high overall wetness and are far from woodland should be prioritised for conservation efforts focusing on wetland birds. They say the best option for managing these areas would be low-intensity grazing, which could also benefit local farmers.

To cite this article/service: "Science for Environment Policy": European Commission DG Environment News Alert Service, edited by SCU, The University of the West of England, Bristol.