SCIENCE FOR ENVIRONMENT POLICY

Could rethinking predator management protect Europe's ground-nesting birds?

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McMahon, B.J., Doyle, S., Gray, A., Kelly, S.B.A. and Redpath, S.M. (2020) European bird declines: Do we need to rethink approaches to the management of abundant generalist predators? *Journal of Applied Ecology*, 57(10): 1885–1890.

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Ground-nesting bird populations are more likely to be in decline than any other European bird species, finds a recent study, with 74% showing evidence of a long-term drop in numbers. The study analyses whether predation by generalist species helps to explain the widespread declines of ground-dwelling birds (such as waders, wildfowl and gamebirds) across Europe. It highlights a potential role for predator management in achieving conservation objectives, and points towards possible effects of different habitat management strategies in Britain, Ireland and Europe.

The two most significant pieces of European policy to protect birds are the Birds[1] and Habitats[2] Directives, which provide legal basis, binding for all Member States, for protection of species and habitats. There is evidence that the Birds Directive has had a positive effect on bird conservation across Europe; however, despite existing conservation efforts, European ground-nesting birds are in a precarious state. Recent factors impacting on the decline of European birds include the effects of intensive agriculture (such as frequent ploughing and pesticides); habitat loss, degradation and fragmentation; invasive species and the impacts of bird-eating predators. This study explores the role of generalist predators, such as the common European red fox (*Vulpes Vulpes*) and species of the Corvidae family (such as the carrion crow (*Corvus corone*) and raven (*Corvus corax*)), in bird population declines — ground-nesting species in particular, given their increased vulnerability to predation.

The researchers analysed bird population trends and distribution changes across Europe, Britain (mainland UK) and the island of Ireland, using data from the Pan European Common Bird Monitoring Scheme (PECBMS) and the British Trust for Ornithology's Bird Atlas project, which mapped birds in winter and the breeding season in Britain and Ireland. A total of 162 species were studied in Europe, 171 in Britain and 107 in Ireland. Each were classified according to three characteristics: nesting strategy (ground or 'other'); status under Annex 1 of the EU Birds Directive (designated or non-designated); and association with agricultural habitats for breeding (primarily agricultural or 'other'). The researchers then analysed the data via statistical modelling.

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The researchers posit that patterns in the declines of bird species — according to nesting strategy, geographical range and breeding area — can be compared with areas containing higher numbers of generalist predators, to ascertain if there is a correlation. For example, if ground-dwelling bird populations are in steeper decline in regions with a greater abundance of foxes — such as Britain and Ireland — then it may be reasonable to suggest that predation is at least partially responsible. This effect of predation would be further supported if Annex 1-designated, ground-dwelling species (those with habitat protection) were declining at the same rate as non-Annex 1 species in that area.

The analysis showed that, across Europe, 74% of ground-nesting bird species are in decline, compared with only 41% of other bird species. This pattern was also noted in Britain and Ireland, with 66% of ground-dwelling species in decline, compared to 31% of other bird species; and 71% compared to 20%, respectively. Notably, ground-dwelling bird numbers were significantly less likely to be declining if covered by Annex 1 protection in Britain, and Annex 1 designation was also found to reduce declines in Europe, although not significantly. In Ireland, the effectiveness of the legislation in practice was more questionable, based on these findings, as the declines in Ireland were greater for Annex 1-designated species than for non-designated species. This is an effect that the researchers suggest could be explained by variation in the management strategies and quality of Natura 2000 sites; Republic of Ireland has one of the lowest proportions of Annex I habitats in 'favourable' conservation status within the EU, and one of the highest proportions of habitats in 'unfavourable–bad' status. The differences between geographical areas may point towards management-related aspects that could be beneficial for ground-nesting birds; the researchers highlight the provision of alternative prey animals, with millions of pheasants released yearly for shooting in the UK, and the absence of apex predators.

The researchers note that although the correlation between increasing predator numbers and decreasing ground-dwelling bird numbers points to a role for generalist predators in the decline, this does not mean that predation is the ultimate cause of the decline. They also note that particular habitat type and landscape features could lead to a greater impact from predators, particularly in fragmented agricultural landscapes, suggesting that large-scale habitat restoration could help to counter the impacts of increases in generalist predators.

The study's findings suggest that ignoring the role of generalist predators in modern European landscapes may exacerbate further population declines and bird species losses. They add that large-scale experiments, to establish causality in how generalist predators impact ground-nesting birds in different landscapes, are urgently required, and conclude that it is necessary to persevere with important debates on predator management in order to conserve ground-nesting species effectively.

1. Directive 2009/147/EC on the conservation of wild birds.
2. (Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora.