



# Science for Environment Policy

## Silage harvesting partly responsible for decline in skylarks

**Farmland birds like skylarks** are attracted to nest in agricultural grassland, but repeated harvesting for silage causes most nests to fail. This study showed that skylark breeding success in silage was too low to sustain local populations. The researchers say that grass silage is a hostile environment for breeding skylarks and conservation efforts should focus on making other parts of the landscape more attractive and productive for nesting birds.

**Agricultural intensification** has led to the decline of many species. Across Europe, the intensified production of silage — grass used as livestock feed — has driven declines in many species of ground-nesting farmland birds. When grass is cut during harvesting, nests become hidden and are abandoned or destroyed, mainly by being run over. The fledglings are also put at risk as they naturally leave the nest before they can fly. Any nests and fledglings that survive are exposed to predators. With the widespread transition from using hay, when the grass is harvested later in the year, to silage, harvests are taking place earlier and more often each year.

For this study, the researchers determined the impact of different types of crop management on skylark (*Alauda arvensis*) fecundity, defined as the number of chicks raised to independence. Skylarks are common in intensively managed grasslands harvested for silage. In Britain, where the study was conducted, a third of the skylark population breeds in intensively managed grassland and the highest densities are found in silage fields.

The researchers tested two interventions: raising cutting heights and delaying mowing. They measured skylark breeding between 2006 and 2008 on 47 silage fields in the southwest of England. Some of the fields were managed normally to act as controls while others were subjected to interventions, and the effect on skylark nesting behaviour and reproductive performance was measured.

These data were fed into a model, which was able to predict the outcome of a much wider range of management interventions without the need for further expensive field trials. The results showed that, under normal silage management, the numbers of chicks raised would have been far too low to sustain local populations, confirming the idea that silage fields are 'sink habitats' for skylarks. In other words, reproduction cannot balance mortality, and to sustain the population skylarks must immigrate from elsewhere.

Assessing different interventions, the researchers found that delaying mowing increased fecundity but not by enough to sustain the local population. Raising cutting heights also improved fecundity, but only by a small amount. Although both measures increased survival of nests and fledglings, neither constitutes an effective conservation measure, as they could only protect a small proportion of nesting attempts.

However, losses during silage harvesting were not the sole cause of low fecundity. Even if no silage cuts were made, the model predicted that fecundity would rise to less than half of the replacement rate.

Even when nests survived natural hazards and silage management, the number of chicks reared was low compared to other habitats, and too low to achieve the population replacement rate. Furthermore, the intervals between consecutive nesting attempts were unusually long on silage fields, which limited the number of possible nesting attempts each year.

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**Contact:**  
[david.buckingham@rspb.org.uk](mailto:david.buckingham@rspb.org.uk)

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These factors could be tackled by increasing food availability, which would improve the fitness of breeding adults and the amount of food available to chicks. To achieve this, the authors suggest providing nearby foraging or breeding habitats, which could counteract the effect of silage fields. These measures should form part of future attempts to address the population decline of skylark and other ground-nesting bird species in grass-dominated farmlands.



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[david.buckingham@rspb.org.uk](mailto:david.buckingham@rspb.org.uk)

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