

Science for Environment Policy

Artichoke fields as good as grassland habitats for lesser kestrels in Italy

Lesser kestrel (*Falco naumanni*) populations survive equally well in grassland and artichoke fields in Italy, a recent study has concluded. Overall, however, populations are declining and the researchers recommend reducing pesticide use, growing alternative crops such as artichokes, and maintaining grasslands as part of the farming landscape.

In Mediterranean pseudo-steppes (areas with vegetation similar to the temperate grassland of Eurasia), the dry grass landscape has been shaped by centuries of low-intensity agro-grazing. However, the landscape is being changed by intensive [agricultural](#) practices and people abandoning the land, threatening farmland birds and other [wildlife](#).

The lesser kestrel is a key species in Mediterranean pseudo-steppes, where it is used as an indicator to monitor bird populations. The birds are vulnerable to habitat loss and degradation and are protected under the [EU Birds Directive](#)¹. The Gela Plain, a southern Italian pseudo-steppe, is home to breeding colonies of lesser kestrels, which typically arrive in spring after overwintering in West Africa. Their populations are fluctuating and it is important to understand why in order to identify the most suitable conservation measures to safeguard local populations.

This study investigated the effect of land use and colony size on the breeding and survival of lesser kestrels in the Gela Plain. From spring to summer, over the period 2004–2012 (excluding 2008), the researchers monitored an average of 14 breeding colonies in the area. They captured breeding adults, marked nestlings and adults with rings for future identification, recorded re-sightings and searched for dead birds.

They combined long-term colony monitoring and capture-recapture data with habitat and colony size data to model the probabilities of survival, the number of fledglings per nest and the expected population growth in three different habitats: artichoke fields, arable land and grassland.

Grasslands, including set-aside and fallow lands, are landscape elements of traditional farming important for lesser kestrels everywhere, while artichoke fields are a more unusual habitat for the species. Intensive activities in artichoke fields, including field preparation, planting, and fertiliser and pesticide applications, occur during the winter when lesser kestrels are in Africa. Artichoke fields are abandoned after mid-April harvesting, when birds come back to breed. Prey availability in the abandoned fields is usually high and sustains lesser kestrels during breeding.

The results showed that the surrounding landscape strongly affected lesser kestrel populations. Adults and juveniles living in colonies surrounded by artichoke fields or grassland had similar survival rates, and were more likely to survive than birds living in colonies surrounded by arable fields. For example, adult birds were more than twice as likely to survive in artichoke fields and grasslands compared with arable fields.

Projected population growth rates revealed that lesser kestrel populations were declining in all three habitats, highlighting the need for conservation measures across the area. However, the decline was higher for colonies surrounded by arable fields compared with those surrounded by artichoke fields or grassland.

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Habitat- and density-
dependent demography of
a colonial raptor in
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1. Directive 2009/147/EC of the
European Parliament and of the
Council of 30 November 2009 on
the conservation of wild birds.
[http://eur-lex.europa.eu/legal-
content/EN/TXT/?uri=CELEX:320
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Compared to grassland and artichoke fields, tall cereal crops, intensively managed over a growing season extended by irrigation, are generally not as good for foraging. Extensive use of pesticides, especially in June when the birds are feeding their young, is particularly harmful. The authors found 68 dead birds across the habitats. Many of the dead birds were found together and the majority were female. The authors suggest this may be because pesticide use coincided with when the lesser kestrels were raising their nestlings (in June).

The study found that survival of adult birds affected population growth the most. Survival of fledglings and the number of breeding pairs in a colony, though important, had a lesser effect on population growth. Furthermore, larger colonies had a small, positive effect on juvenile survival but a negative effect on breeding, compared with smaller colonies. None of the habitat types appeared to affect the size of colonies found in them.

The researchers say that methods to conserve lesser kestrel populations should be based on protecting adult birds – ideally through a return to low intensity agriculture. Where this is not feasible, this study has demonstrated that artichoke fields may also provide suitable habitats for the birds. To help conserve the birds, the authors recommend that agri-environmental schemes focus on organic farming of artichokes, with minimal use of pesticides and leaving grass margins around arable fields.

It is not yet clear exactly which aspects of artichoke production makes the fields attractive habitats for the kestrels. It has also not yet been established whether the same characteristics apply to other forms of vegetable cultivation after harvest.

