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► To cite this version:

Ángel Frutos, Pedro P. Olea, Patricia Mateo-Tomás, Francisco J. Purroy. The role of fallow in habitat use by the Lesser Kestrel during the post-fledging period: inferring potential conservation implications from the abolition of obligatory set-aside. *European Journal of Wildlife Research*, 2009, 56 (4), pp.503-511. 10.1007/s10344-009-0338-4 . hal-00535265

HAL Id: hal-00535265

<https://hal.science/hal-00535265>

Submitted on 11 Nov 2010

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The role of fallow in habitat use by the Lesser Kestrel during the post-fledging period: inferring potential conservation implications from the abolition of obligatory set-aside

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Received: 31 May 2009 / Revised: 15 September 2009 / Accepted: 12 October 2009 / Published online: 4 November 2009
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Abstract The maintenance of fallows has been shown to prevent the loss of farmland biodiversity caused by agricultural intensification. These are mainly introduced as part of both obligatory and voluntary set-aside schemes. However, the obligatory set-aside has recently been abolished by the Common Agricultural Policy Health Check. In this study, we examine the role of fallow in fine-grained habitat use by a threatened farmland bird (Lesser Kestrel) during summer in northwestern Spain. To analyze Lesser Kestrel occurrence, we used generalized linear models, a theoretic-information approach and a hierarchical partitioning analysis. The best AIC-based models explaining occurrence of Lesser Kestrels showed that fallow was the more important habitat type followed, to a lesser extent, by dry cereal stubble and field margin. In contrast, irrigated crops negatively influenced occurrence. Heterogeneity of crop mosaic was not important in explaining occurrence of Lesser Kestrel. Fallows, like dry cereal

stubbles and field margins, seem to be suitable for foraging given the abundance of high food resources and their availability due to shorter vegetation cover. The abolition of the obligatory set-aside could reduce the total surface of fallow land (approximately 40.9%), likely affecting habitat use by Lesser Kestrel through an increase of other non-preferred crops (e.g., irrigated crops) or by decreasing food resources. Agri-environment schemes focusing on the maintenance of low-intensive farming systems with a mosaic of crops and semi-natural habitats interspersed should be promoted in premigratory areas to maintain Lesser Kestrel.

Keywords Obligatory set-aside · Fallow · Health check · *Falco naumanni* · Post-fledging period · Habitat selection

Introduction

The loss of biodiversity in the European farmlands during the last decades is well documented (Krebs et al. 1999; Donald et al. 2001; see review of Benton et al. 2003). Erosion of biodiversity is mainly consequence of the agricultural intensification (Donald et al. 2001), which is promoted by the Common Agricultural Policy (CAP). The increased agricultural intensity has produced profound changes in farming practices such as the crop homogenization, simplified rotations, and removal of semi-natural habitats, such as fallows (Petit and Firbank 2006). In order to minimize the environmental impact of intensive agriculture, voluntary agri-environmental schemes were introduced (Kleijn and Sutherland 2003). Some of these measures, such the voluntary set-aside, target on protecting biodiversity and restoring landscape (Kleijn and Sutherland 2003). Additionally, some agriculture obligations, such as

Communicated by W. Lutz

Electronic supplementary material The online version of this article (doi:10.1007/s10344-009-0338-4) contains supplementary material, which is available to authorized users.

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the compulsory set-aside (European Commission 2009), have been shown to correct loss of biodiversity (review of Van Buskirk and Willi 2004; MacDonald et al. 2007). The compulsory set-aside obligated farmers to leave 10% of their cultivated land as fallow each year to reduce agricultural surpluses (Buckingham et al. 1999). However, the CAP Health Check has recently approved the abolition of this obligatory set-aside in response to both the current high cereal prices and the low cereal yields (European Commission 2009). This abolition is thus expected to reduce the surface of fallow land. Fallows as well as the field margins have demonstrated to be reservoirs of farmland biodiversity (Wilson et al. 1999; Marshall and Moonen 2002; Duelli and Obrist 2003). These semi-natural habitats also increase farmland heterogeneity, which has a key role in maintaining biodiversity in agricultural landscapes (Benton et al. 2003). In order to correctly establish recommendations of changing agricultural management practices in conservation, it is essential to know how these practices affect farmland biodiversity.

The detailed knowledge of a species habitat needs is essential in developing effective habitat management strategies, especially for species of high conservation concern such as the Lesser Kestrel (*Falco naumanni*) in Europe (BirdLife International 2009), considered as a potential flagship species for the farmland biodiversity (Biber 1996; Rodríguez and Wiegand 2009). Numerous studies on habitat use in migratory farmland birds have shown that fallow is an important habitat during the breeding and winter seasons (e.g., Delgado and Moreira 2000; Silva et al. 2004; Wretenberg et al. 2007). Whether fallow is also important during the post-fledging period is not known. The post-fledging period, which ranges from fledging to departure on fall migration (e.g., Rivera et al. 1998), is considered to be important for migratory birds because they must build-up fat reserves (Rivera et al. 1999) and molt (at least partly; see Rivera et al. 1998) prior the fall migration. In a study carried out by De Frutos and Olea (2008), Lesser Kestrel did not select fallow at both home-range and core-area extents (346.8 ha and 92.7 ha, respectively). However, Lesser Kestrel may look at a smaller spatial extent (García et al. 2006), as shown in other bird species (Johnson 1980; Aebischer et al. 1993). Knowing the role of fallow at a finer scale can be relevant to predict both the effects of the imminent abolition of the compulsory set-aside and to plan efficiently management practices for conservation of Lesser Kestrel and of farmland biodiversity in general.

In this study, we aimed to examine the role of fallow in habitat use by Lesser Kestrel during the post-fledging period at a fine scale in an extensively farmed area. We also assessed the heterogeneity of crop mosaics and identified which elements of fine-grained habitat (i.e., types of crops)

are relevant for designing habitat management strategies that contribute to maintain viable populations of Lesser Kestrels during the post-fledging period.

Materials and methods

Study area

The study was carried out in a 1,200 km² area in the province of León, NW Spain (centered at 5°15'W 42°21'N; annual average temperature, 11.7°C and mean annual rainfall, 486 mm; see details in De Frutos et al. 2007). The landscape is mainly flat and open, with scarce natural vegetation. The area is broken up by a number of small seasonal streams flowing north–south; here are located most semi-natural grassland and poplar groves. Deciduous–mixed forests are scarce and scattered. The habitat consists mainly of extensive farmland (81.7% of the study area surface), 2-year rotation system. Dry cereals (50.4% of the farmland surface) and ploughed fallow (30.8%) constituted the main crops. We carried out the study when almost all the cereal cultures had been harvested (99.9% of the dry cereal surface), remaining as stubbles and being exploited by a low grazing intensity while ploughed fields had not been sown yet. At a lesser extent, the leguminous crops (bean, lupine, pea, and dry alfalfa; 8.4% of the farmland surface), non-ploughed fallow (5.3%), irrigated crops (maize, beet, horticulture, and irrigated alfalfa; 2.8%), vineyard (1.5%), and sunflower (0.8%) were present in the study area.

In 2002, when this study was done, 23 breeding pairs of Lesser Kestrel were documented in the study area (De Frutos and Olea 2008). During summer (July to September), this area holds yet a large post-breeding Lesser Kestrel population, close to 1,000 individuals (Olea et al. 2004), which gather in communal roosts from where they disperse daily to forage (De Frutos and Olea 2008).

Data collection

Lesser Kestrel observations were obtained by surveys carried out between 11th August and 7th September of 2002, when Lesser Kestrel abundance in the area peaked (i.e., between 15th August and 15th September; see Olea et al. 2004). Survey routes of 350 km in total ($n=16$ routes adequately distributed through the study area, see De Frutos et al. 2007) were covered in car at a low speed (approximately 20 km/h) for censusing kestrels. Censuses by car have been considered as a reliable method to count raptors, at least, in open landscape (Viñuela 1997). We counted Lesser Kestrels localized within a strip 250-m wide at each side of the itinerary (see De Frutos et al. 2007)

using binoculars and spotting scope. Windy and rainy conditions were avoided for censusing. For each Lesser Kestrel registration, we recorded x - y coordinates, time of detection, habitat type, and bird activity (Table 1). To avoid circadian rhythms of activity, kestrels were surveyed all day (Tella et al. 1998) since kestrels are active throughout the day (see Donázar et al. 1993; Parr et al. 1997; Tella et al. 1998; Vlachos et al. 2003). To avoid counting Lesser Kestrel associated with roosting, we did not census during 2 h after sunrise and 2 h before sunset (see Olea et al. 2004). Furthermore, to reduce possible pseudo-replication due to multiple counts of same Lesser Kestrels, we covered each survey route only one time, and a minimum distance of 1 km was maintained between routes surveyed (the mean core-area size of Lesser Kestrel during the post-fledging period is of 92.7 ha, i.e., $\sim 1 \text{ km}^2$, De Frutos and Olea 2008).

Data treatment

To analyze the habitat use, we used a “use versus available” approach (see advantages in Klar et al. 2008). Firstly, we generated two sets of points (i.e., use and available). Use locations corresponded to Lesser Kestrels detected during the surveys (see above; $n=127$). As a sample of availability, we randomly distributed as many additional points (i.e., the available locations; $n=127$) as use locations within a strip 250-m wide at each side of the survey routes. Each use and available location was

buffered with 50-, 150-, and 250 m-radii. The 50-meter radius has been previously used for analyzing habitat–bird relationships (e.g., Young and Hutto 2002; Laiolo et al. 2004; Jones and Sieving 2006). Those radii covering 1, 7, and 20 ha, respectively, were chosen smaller than the core-area (92.7 ha De Frutos and Olea 2008; i.e., ~ 500 – 600 -m radius plot) and with increasing size in order to look at the spatial extent at which environmental variables better explained selection by Lesser Kestrel. To avoid overlapping buffers, a minimum distance of 500 m was maintained between use and available locations. Habitat-predictor variables were measured within these buffers using ARCGIS 9.2 (Environmental Systems Research Institute Inc.). Given that De Frutos and Olea (2008) found that the landscape-scale habitat covers of farmland was by far the most important habitat for foraging Lesser Kestrel during summer in this study area, we only focused on fine-grained habitat covers within farmland, including fallows and field margins. For this, we measured the more frequent crop types (dry cereal stubbles, leguminous crops, and irrigated crops), field margins (strips with grass vegetation separating fields from roads, but almost non-existent between fields; Table 1), and fallows. These habitat covers were measured as the relative proportions of each habitat within the buffers from a digital land-use layer obtained from georeferenced aerial photographs (0.7-m pixel resolution), which were updated by field observations at the time of the study. In our study area, fallows resulted from the voluntary and the obligatory set-

Table 1 Habitat characteristics used for analyzing the role of fallows in habitat use by Lesser Kestrel in a Spanish extensive farmland during the post-breeding period

Variable	Definition
Habitat cover	
Field margin	Surface in percent of field margins
Crop type	
Dry cereal stubble	Surface in percent of dry cereal stubbles
Ploughed fallow	Surface in percent of ploughed fallows
Fallow	Surface in percent of non-ploughed fallows
Leguminous crop	Surface in percent of leguminous crops
Irrigated crop	Surface in percent of irrigated crops
Heterogeneity of crop mosaics	
Habitat edge density (edge)	Total edge length in meters of all crop types including field margins per square kilometer
Landscape heterogeneity of crops (cropheter)	Crop habitat diversity using Shannon’s diversity index
Richness	Number of different types of crops
Distance to the nearest colony (Dcolony10)	Distance in meters to the nearest colony with more than ten breeding pairs from the center of each grid square
Distance to the nearest roost (Droost)	Distance in meters to the nearest roost from the center of each grid square
Electrical wires (wire)	Total length in meters of electrical wires

These variables were measured within plots of 50, 150, and 250 m of radius centered on Lesser Kestrel and random locations

asides (Table 1), and they were grouped. The identification in situ of each type of set-aside was not clear, and access to the official data at the municipal scale was unavailable due to their confidentiality. Therefore, instead of classifying fallows according to the set-aside types, we assigned them to one of the following cover classes according to the vegetation cover: ploughed fallow (recently ploughed fields without a significant herbaceous vegetation cover) and fallow (old fallow over 1 year; Table 1). Three variables quantifying heterogeneity of crop mosaics were calculated: two variables relating to the crop heterogeneities (Cropheter: habitat diversity of crop types using Shannon's diversity index; Heikkinen et al. 2004; Richness: number of different types of crops; Table 1) and one relating to the habitat-edge densities (Edge: total edge length of all crop types including field margins per square kilometer; Heikkinen et al. 2004; Table 1). Kestrels may select perches as look-out posts (Aparicio 1990; personal observations), so total length of electrical wires (Wire, see Table 1) within each buffer was also considered as an explanatory variable. It was measured from a digital cartographic map and validated by field observations. Since distribution of both breeding colonies and communal roosts of Lesser Kestrel influences its abundance within the study area (see De Frutos et al. 2007), breeding colonies and communal roosts within and outside the study area were mapped. Based on this information, we generated two raster layers: "distance to the nearest roost" (Droost) and "distance to the nearest colony with more than ten breeding pairs" (Dcolony10) both calculated from the center of each buffer (Table 1).

Statistical analysis

First, we used the Spearman's rank correlation to explore the correlations between the variables measured at each spatial extent (Table 1, Table S1 in supplementary material). The highly correlated variables ($|r_s| > 0.5$) were included separately in the models (i.e., they were not put together in the same model) in the multivariate regression analyses (Table 2). The models were performed to identify the environmental variables that influenced presence of Lesser Kestrel and the spatial extent at which they were selected. We modelled the presence/absence of Lesser Kestrel as a function of the explanatory variables at each spatial extent using GLM with a logistic link function and a binomial error distribution. We performed all possible model permutations of the explanatory variables for each spatial extension. Resultant models for each spatial extent were ranked altogether using the second order information criterion (AICc) and the Akaike weight of each model (ω_m ; Olea 2009), estimated following Burnham and Anderson (2002). Akaike weight is the relative likelihood of that

model being the Kullback–Leibler best model within a set of n models, with $\omega_m > 0.9$ indicating a high level of support for a given model. We constructed a 95% confidence set of models by starting with the highest Akaike weight and adding the model with the next highest weight until the cumulative sum of weights exceeded 0.95 (Burnham and Anderson 2002). A model filtering procedure was then applied by removing the more complex models that did not have an AIC value which was lower than all the simpler models within which they were nested (i.e., the same model with at least one additional variable; Richards 2008). The filtered models for each spatial extent were pulled together and ranked according to their AICc values. To know the relative contribution of each variable, we calculated their Akaike weights. The Akaike weight for each variable (ω_i) was calculated by summing, from the set of models within the 95% probability, the weights of those containing the variable, with the variables with the highest weight ($\sum \omega_m$) being more important relative to the others. Additionally, we examined models with non-linear variables (second-order polynomial), which were no better than those with linear variables, so only linear variables were considered.

We also checked the assumption of independent errors by examining Moran's correlograms of residuals of the best models (see De Frutos et al. 2007). Correlograms plot the Moran's Index (I) coefficients against distances between localities (Legendre and Fortin 1989). This index indicates the degree of similarity/dissimilarity between the values of the residuals in this case. Distance classes for the correlogram were defined maximizing the similarity in the number of interactions between pairs of localities (Diniz et al. 2003). To test the significance of these Moran's coefficients for each lag distance, 9,999 Monte Carlo permutations of the model residuals were performed and its P values were calculated (Heikkinen et al. 2004). The Moran's correlogram as a whole is considered significant if at least one of its coefficients is significant at the probability level after progressive Bonferroni correction (here $P \leq 0.01$). The distance classes, Moran's I statistics and correlograms were computed using the freeware package SAM (Spatial Analysis in Macroecology; Rangel et al. 2006).

Additionally, a hierarchical partitioning analysis (HP; Mac Nally 2002) was also performed using the explanatory variables included in the best AIC-based models (95% confidence, see above) explaining occurrence of Lesser Kestrels. This HP procedure calculates the independent contribution that each explanatory variable has on the response variable and separates it from the conjoint contribution, resulting from correlation with other variables. The method of fitting the model to the data was by least squares (i.e., the goodness-of-fit measures were calculated by R^2 ; Walsh and Mac Nally 2004).

Table 2 Ranking of the best models ($\Sigma\omega_m=95\%$) explaining occurrence of Lesser Kestrels according to their AICc values after applying the filtering procedure

Models	Spatial extent	$\Delta AICc$	ω_m value	Ranking
Droost + Dcolony10 + wire + field margin + dry cereal stubble + fallow	50	0.00	0.324	1
Droost + Dcolony10 + wire + dry cereal stubble + irrigated crop + fallow	50	0.78	0.219	2
Droost + Dcolony10 + wire + dry cereal stubble + fallow	50	0.82	0.215	3
Droost + Dcolony10 + wire + irrigated crop + fallow	50	2.81	0.079	4
Droost + Dcolony10 + wire + field margin + fallow	50	4.05	0.043	5
Droost + Dcolony10 + wire + fallow	50	4.06	0.043	6
Droost + Dcolony10 + wire + field margin + dry cereal stubble	50	5.71	0.019	7
Droost + Dcolony10 + wire + dry cereal stubble + irrigated crop	50	5.95	0.017	8

ω_m Akaike weight of each model. Bolder variables influenced negatively in the occurrence of Lesser Kestrel

All the modelling analyses were run in the R statistical software (R Version 2.6.2; The R Foundation for Statistical Computing 2008) using the “hier.part” package (Walsh and Mac Nally 2004).

Results

The best AIC-based models ($\Sigma\omega_m=95\%$ confidence) explaining occurrence of Lesser Kestrels were performed at the 50-m radius spatial extent (Table 2). These best models included together seven variables, appearing three variables (Droost, Dcolony10, and Wire) in all of them (i.e., $\omega_i=1$, Fig. 1a, Table 2). Wire was the most important variable explaining occurrence of Lesser Kestrel (70.7% of independent explained variability according to the HP results, Fig. 1b), which positively influenced occurrence. It increased in areas near to the breeding colony (15.0% of independent explained variability, Fig. 1b) and to the roost (14.3%). Fallow and dry cereal stubble positively influenced occurrence and had a moderate–high relative contribution to the models ($\omega_i=0.8$ and 8.2% of independent explained variability for fallow and $\omega_i=0.6$ and 4.2% for dry cereal stubble). Field margin (3.6% of independent explained variability) and irrigated crop (2.8%) had a lesser relative importance ($\omega_i=0.37$ in both cases). Irrigated crop negatively influenced occurrence.

Results of the hierarchical partitioning (Fig. 1b) were consistent with the relative contributions from the best AIC-based models ($\Sigma\omega_m=95\%$ confidence; Fig. 1a).

Among the habitat variables, fallow was the best predictor to explain occurrence, being significantly more abundant in areas used by Lesser Kestrels (Fig. 1a, b and Fig. 2; ANOVA test; $F=4.07$; $P=0.048$).

Residuals from the best AIC-based models (95% confidence; $n=8$ models; Table 2) did not show a significant spatial pattern (Table S2 in supplementary material).

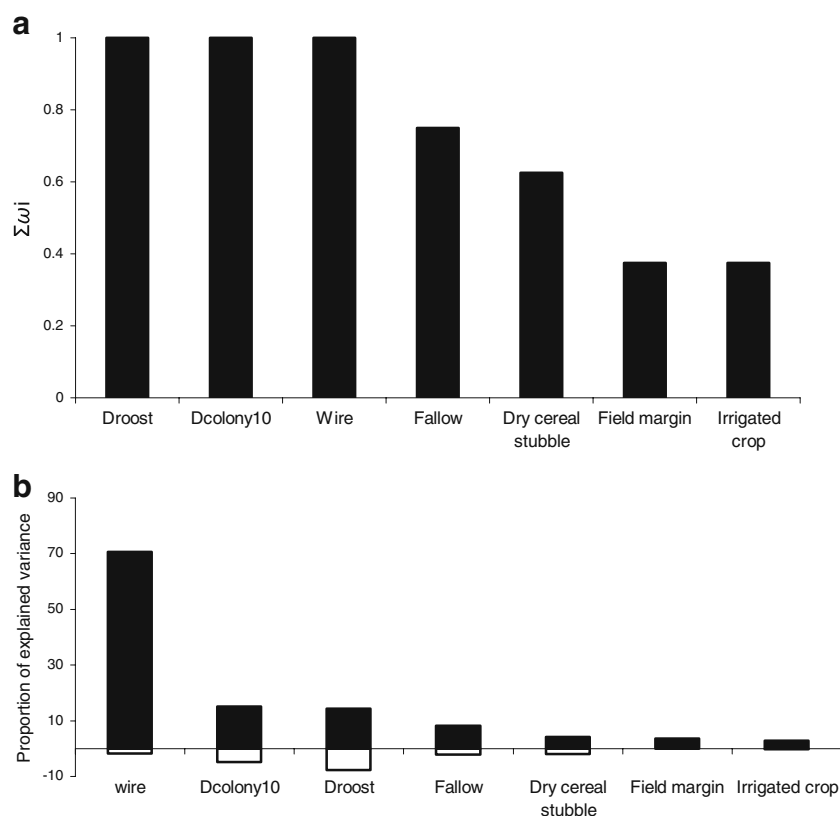
Discussion

This study revealed that fallow, dry cereal stubble, and field margin positively influenced on the occurrence of Lesser Kestrel during the post-fledging period, with fallow being the habitat type more important. In contrast, irrigated crops influenced negatively the occurrence of Lesser Kestrel. Like previously documented (De Frutos et al. 2007; De Frutos and Olea 2008), occurrence of Lesser Kestrel diminished with the distance to both the nearest roost and the breeding colony. The positive association between occurrence of Lesser Kestrel and wires, which was the best predictor, is concordant with that observed by De Frutos et al. (2007). Lesser Kestrels are easier detectable when perching than when standing on the ground. Alternatively, these human structures are also quite used as look-out posts (Aparicio 1990; authors, unpublished data), suggesting to be an important factor determining the foraging Lesser Kestrel distribution during summer.

Results demonstrate the importance of the low-intensity farming system, which allows the coexistence of crop fields with patches of semi-natural habitats such as fallows and field margins. There was no significant effect of the variables used to measure heterogeneity of crop mosaic in our models. This suggests that Lesser Kestrel occurrence depend more on the abundance and distribution of particular habitats that on habitat heterogeneity per se, as has been suggested for other farmland bird species (Heikkinen et al. 2004; Brambilla et al. 2008).

The positive effect of fallow on Lesser Kestrel occurrence might be related to the food resources, which might be also the case for dry cereal stubble and field margin. Arthropod species, mainly Orthoptera, are known to be the main part of Lesser Kestrel’s diet during the post-fledging period (Franco and Andrada 1977; Tejero et al. 1982; authors unpublished data). Many studies have shown that higher diversity and abundance of arthropods are associated with these habitats in the farmed landscape not only during

Fig. 1 a Relative contribution of each variable in the best models ($\Sigma\omega_m=95\%$) explaining occurrence of Lesser Kestrels (see Table 2) according to the sum of its Akaike weights ($\Sigma\omega_i$). Droost, Dcolony10, and irrigated crop influenced negatively in the occurrence of Lesser Kestrel. **b** Results of the hierarchical partitioning analysis. Percentage of independent (black bars) and joint (white bars) contributions to the total explanatory power of each variable included in the best AIC-based models ($\Sigma\omega_m=95\%$ confidence; $n=8$ models; see Table 2) explaining occurrence of Lesser Kestrels in a 384 km² Spanish farmland during summer of 2002. Note that negative joint contribution of one variable in HP indicates that the other variables act as suppressor on the particular variable



summer (e.g., Tellería 1988; Henderson et al. 2000a) but also during other seasons (e.g., breeding season, Rodríguez et al. 2006; Traba et al. 2008). Moreover, these habitats presumably are suitable for foraging because they have short vegetation (Henderson et al. 2000b; Rodríguez et al. 2006, authors, unpublished data) providing good prey accessibility (García et al. 2006; Rodríguez et al. 2006, authors, unpublished data), and hunting areas (unpublished data). De Frutos and Olea (2008) found that these habitats

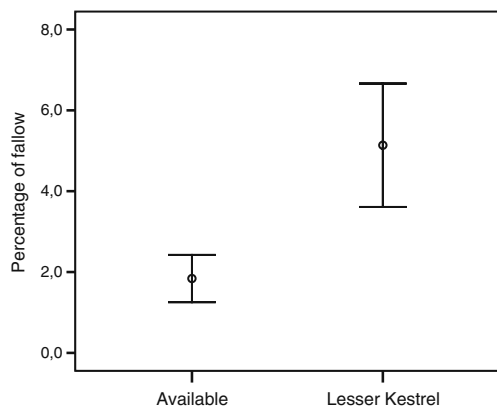


Fig. 2 Means (± 1 SE) of percentage of fallow in the available and used plots by Lesser Kestrel at the 50-m radius spatial extent

were not selected by summering Lesser Kestrels at both home range and core-area scale. Here, we studied habitat use by Lesser Kestrel at a smaller scale (50-m radius plot), i.e., a small percentage (namely, 1%) of the surface covered by the core area of Lesser Kestrel. This suggests that habitat requirements can vary between different spatial scales, agreeing to Johnson (1980).

In our study area, part of fallow land has been encouraged by agri-environmental schemes oriented to enhance biodiversity conservation, especially farmland birds (see Llusia and Oñate 2004, personal observations). However, the total surface of fallow land is expected to be reduced (approximately 40.9%, see European Commission 2009; Vanni 2009) due to the recent abolition of the obligatory set-aside. The consequences of this abolition are not clear at all, but it could increase the surface of arable land by sowing the fallows (i.e., both ploughed and non-ploughed fallows). Surface values of other crop types, non-used by Lesser Kestrel, might also increase (e.g., increase of the surface of irrigated crops, see below). In addition, a reduction of non-ploughed fallow could also have an indirect effect on Lesser Kestrel through a decrease in food resources such as Orthoptera (main resource in summer, see above; authors, unpublished data), whose highly mobile species can disperse from fallow to other crops (e.g., dry cereal stubble; see Douglas et al. 2009), like a source–sink

system. Fallow has been proved to be a preferred habitat for foraging in other farmland birds during summer (Henderson et al. 2000a; Henderson et al. 2000b), including many endangered species [e.g., Great Bustard *Otis tarda* (Moreira et al. 2004), Little Bustard *Tetrax tetrax*, and Black-bellied Sandgrouse *Pterocles orientalis* (Delgado and Moreira 2000)]. Fallow is a particularly important habitat for farmland birds and, according to other studies, for other taxonomic groups (e.g., weed seeds, plants and invertebrates; see Henderson et al. 2000a; Henderson et al. 2000b; Van Buskirk and Willi 2004; Traba et al. 2008), acting like reservoirs of farmland biodiversity.

The negative effect of irrigated crops on occurrence of Lesser Kestrel during summer agrees with that observed with De Frutos and Olea (2008), which suggested that the avoidance of these crops by Lesser Kestrel may be related with the low availability and accessibility of prey for the aerial hunting Lesser Kestrels. In our study area, irrigated crops are characterized by dense and tall vegetation and higher pesticide inputs (Tejedo et al. 2008), maize being the main irrigated crop type (approximately 90%). Our study area will be inevitably transformed into irrigated crops (up to 40–52% of the surface of the study area), involving a field enlargement, in detriment of field margins, and a crop homogenization. This increased irrigated surface is likely to affect negatively to Lesser Kestrel occurrence in the study area. Therefore, agri-environment schemes focusing on the maintenance of low-intensive farming system with a mosaic of crops, particularly with dry cereal fields, and seminatural habitats interspersed are, a priori, expected to maintain Lesser Kestrel persistence and thus farmland biodiversity in general (Stoate and Parish 2001; Tilman et al. 2001; Benton et al. 2003; Green et al. 2005). In our study area Lesser Kestrels used areas formed by a mosaic of habitats dominated by dry cereal stubbles (54.8% relative to the surface covered by the 50 m-radius plot), followed by non-ploughed fallows (5.1%) and field margins (3.4%). Currently, compensation payments for conservation measures are on a voluntary basis, and they should be highly prioritized in premigratory areas, where Lesser Kestrel survival may be highly dependent on how these areas are managed. This issue can be particularly relevant in summer during which a significant fraction of the Spanish Lesser Kestrel population can gather in only a few roost sites (see Ursúa and Tella 2001; Olea et al. 2004). Therefore, the persistence of fallow around communal roosts in premigratory areas of Lesser Kestrel should be promoted.

Acknowledgments We are grateful to Olga Mora, Hugo Robles, Enrique Osorio and Rubén Vera for their help during the fieldwork. The georeferenced aerial photographs were provided by the Junta de Castilla y León. This research was partially supported by Monte León-

Caja España Foundation, University of León (project ULE 2005–08), Junta de Castilla y León (project SEK02B06), and Ministerio de Educación y Ciencia (project CGL2006-05047/BOS). A. F. was financed by FPU predoctoral fellowship of the University of León. P. M. T. was supported by a PhD scholarship funded by the Spanish Ministerio de Educación y Ciencia. Two anonymous referees are acknowledged for the valuable and constructive comments they gave to improve the paper.

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