

Lesser Kestrel (*Falco naumanni*) – Spain



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Conservation status	EU27: Secure
Protection status	Birds Directive: Annex I CMS: Appendices I and II Bern Convention: Appendix II
EU population (2008-12)	EU: 25,700–29,300 pairs; ES: 14,072–14,686 pairs
MS where increasing	ES, FR, IT, PT
Other MS	BG, CZ, GR, RO, SI

Summary: The Lesser Kestrel declined across Europe in the 20th Century as a result of changes in the agricultural environment. Less labour intensive farming led to the abandonment and ruin of the agricultural buildings used for nesting, while more input intensive farming reduced the availability of insect prey. Spain, which holds around half the European population, experienced the lowest point (circa 4,700 pairs) in 1988–89, after which, numbers rose until about 2012, when they exceeded 14,000 pairs. The measures driving this recovery were the set-aside requirements of the EU Common Agricultural Policy in the 1990s and 2000s, and, the implementation of national and regional legislation and conservation plans, notably including the widespread provision of artificial nesting sites. Since 2012, the population has declined sharply prompting a renewed focus on the threats to the species.

Background

Status and EU occurrence

Lesser Kestrels (*Falco naumanni*)¹ breed from Portugal in the west to south-east Mongolia/northern China in the east, generally around the latitude of the Mediterranean Sea, but reaching significantly further north in Kazakhstan and southern Russia, both west of the southern Urals and into Siberia to the north of western Mongolia. In Europe, the breeding distribution is disjunct. Sizeable areas are occupied in Portugal, Spain, and every European country along the Mediterranean Sea to Turkey (often well inland), with the exceptions of Slovenia and Montenegro. It formerly bred in Austria, Czech Republic, Slovakia and Slovenia. Most European birds migrate to winter in suitable habitat throughout Africa, but South Africa and Senegal are particularly important. Small European wintering populations are found in south-west Spain and southern Italy (BirdLife International, 2015; BirdLife International, 2018).

The world population is well in excess of 100,000 mature individuals, approximately 25–50% of which (25,700–29,300 pairs) breed in Europe, half of these (circa 14,375 pairs), in Spain. During the second half of the 20th Century, the western populations declined from Portugal to Russia and Kazakhstan by about 95%, reaching a low point estimated at around 4,293–5,089 pairs in Spain. The population started to recover in Spain in 1988 and in Italy in 2000. The species was therefore classified as Threatened/Vulnerable by the IUCN from 1988 until 2011, when it was down-listed to Least Concern. It is now considered Least Concern in Europe and the EU27 (Atienza and Tella, 2004; ETC/BD, 2014; BirdLife International, 2015; (Galanaki, Kominos and John Jones, 2017); BirdLife International, 2018).

According to Article 12 reporting under the Birds Directive, the Lesser Kestrel's conservation status for the EU27 2008-2012 was assessed as 'Secure' overall, with an increasing population. Spain assessed the species'

¹ Natura 2000 code: A095

population as increasing in both the long and the short term and considered the breeding range to be stable in the short term, although it is smaller than it was in 1980 (ETC/BD, 2014).

The population in Andalusia in 2012 was 5,057 pairs – over one third of the Spanish population. However, a drastic decline has been observed since then, and census results for 2016 and 2017 produced counts of around 2,500 pairs. These declines are reflected nationally and in France, and probably more widely (SEO/BirdLife, 2014; Garrido pers comm, 2018).

Ecological requirements

Lesser Kestrels mainly feed on aerial and terrestrial insects, but also other invertebrates such as earthworms. They forage in steppe-like habitats, natural and managed grasslands and non-intensively-cultivated areas. Fallows and dry cereal fields in the 'pseudo-steppes' are considered the favoured habitat in many parts of Europe. More intensively farmed areas are occupied, but studies show their home range is approximately five times greater than in traditionally cultivated 'pseudo steppes'. Either way, tracks, field margins and fallow fields are often used for hunting. Olive (*Olea europaea*) groves and matorral scrub are avoided. In general, foraging habitats close to the nesting site are preferred.

Away from the steppic habitats, Spanish research found that vegetation structure is a more important determinant of foraging behaviour in agricultural environments than crop-type. The Lesser Kestrel diet varies over the breeding season and they prefer different crops at different times of year – choosing those with short vegetation and intermediate levels of vegetation cover. They also like certain agricultural activities such as ploughing, probably because soil invertebrates are brought to the surface (Galanaki, Kominos and John Jones, 2017; Rodríguez et al, 2014; CMAyOT, 2014b).

Lesser Kestrel is a colonial breeder. It nests mainly in human constructions, such as large old buildings, houses, walls and ruins, in towns or in rural areas. The nest is placed in a hollow, below eaves, or in the roof space where accessible, and it has taken readily to artificial nesting boxes in some areas, including Spain. The species also uses natural sites, for example rock faces, clay banks and quarries, and occasionally old corvid nests. The species is quite adaptable in its ability to find and occupy new nest sites (if available) when old ones fall into ruin. Clutches of three to six eggs are typical, laid mainly in May (CMAyOT, 2014b; BirdLife International, 2015).

Pressures and threats

Lesser Kestrel's primary pressures and threats are the loss of potential nest sites and reduced prey availability through changes in the agricultural environment, both in terms of habitat and the use of insecticides. The relative importance of pressures outside the breeding season has not been quantified.

The Spanish Article 12 report lists the most important pressure/threats to Lesser Kestrel as agricultural intensification, agricultural abandonment, reduction in prey availability and the destruction or demolition of buildings. Of medium importance are: habitat changes such as irrigation, removal of woody vegetation and switches in crops; loss of nesting sites through the renovation of buildings; the impact of chemicals on prey and habitat; collisions on wind farms; and pressures/threats in the wintering range. Conversion to Olive groves is notable among these.

Predation is considered less important, although regional assessments highlight the young, especially, being taken by Rats (*Rattus* spp.) and Domestic Cats (*Felis catus*) and competition for nest sites from Feral Pigeons (*Columba livia*) or both factors with Jackdaws (*Corvus monedula*) and Dormice (Gliridae) (Atienza and Tella, 2004; ETC/BD, 2014; CMAyOT, 2014b; de las Heras pers comm, 2018; Junta de Extremadura, undated).

Afforestation is an issue in some parts of Europe (BirdLife International, 2015).

Electrocution and collisions with powerlines and wind turbines are not as significant a factor as with larger raptors. However, they are a cause some mortality, particularly among juveniles (Consejería de Presidencia, 2011; CMAyOT, 2014b; University of Salamanca, 2016).

As with any bird, some chicks and fledglings fall from the nest by chance, but predators and in some instances mites can drive unusual numbers to their death in this way (Murcia.com, 2018; Junta de Extremadura, undated).

The causes of the recent decline in the Andalusian population are not known for certain, but are suspected to be related, in part, to reduction in the amount of fallow land, which has declined since CAP set-aside requirements were abolished. The rate of population decline (approx. 50%) is steeper than the decline in fallow land (approx. 25%), but alongside more general agricultural intensification or loss of nest sites, may

explain the more pronounced decline of colonies nesting in rural areas compared with urban ones. However, various potential threats in Africa, such as hunting for food, drought, or, reductions in orthopterans numbers or direct poisoning through insecticide use, may also be implicated (Garrido pers comm, 2018).

Drivers of improvements: actors, actions and their implementation approaches

Organisers, partners, supporters and other stakeholders

As a 'flagship species', the Lesser Kestrel has benefitted from a wide range of conservation measures targeting it. Consequently there are too many stakeholders to name individually, however, the groups they fall into and their roles include the following:

- government (EU; national; regional; local) – legislation, finance, project leadership, monitoring
- NGO – project leadership, conservation actions, research, monitoring, public awareness
- universities/research institutions – research
- private environmental contractors – conservation actions
- electricity distributors – conservation actions
- organisations representing the agricultural sector – project leadership, advisory, brokerage
- farmers, landowners and hunters – conservation actions, access and permission
- the wildlife tourism sector – economic development, public awareness
- private sector funding organisations – finance
- general public – support for/interest in conservation

Contributions / relevance of strategic plans

Legislation and action plans have been an important factor in the conservation of the Lesser Kestrel in Spain (ETC/BD, 2014). Historically, raptors have been protected by Spanish law since 1966, and modern legislation relating to the Birds and Habitats Directives has continued this trajectory. The 1989 Conservation of Natural Spaces and of Wild Flora and Fauna Law and 2007 Natural Heritage and Biodiversity Law both required recovery, conservation or management plans at the regional level (Comunidades Autónomas), according to the extinction risk of each species. Lesser Kestrel was categorised as 'special interest' nationally in both the 1990 and 2011 species and habitat lists. On that basis, only a management plan for each administrative region, which determined the measures needed to maintain an adequate population, was required.

However, both these laws enabled the Regional Governments to establish their own lists of protected taxa. In several cases, Lesser Kestrel was and/or is categorised as 'Sensitive to habitat change', Vulnerable, or Endangered (including Aragón, Castilla-La Mancha, Madrid, Murcia and Valencia). Species in these categories require more involved recovery or conservation plans and positive measures for their conservation to be implemented by the Regional Government, as well as monitoring. The 2007 Natural Heritage and Biodiversity Law also introduced a time-frame for the production of these plans (3 years for Endangered species and 5 years for Vulnerable), which was lacking in the 1989 law, possibly explaining implementation gaps. As a result, a suite of species action plans exist for several of these Regions.

The 2007 Law is also the instrument by which the Natura 2000 Sites legislation of the Habitats Directive was transposed into Spanish Law. Again, the proposal of sites, development of management plans and implementation of conservation measures is devolved to Regional Governments. This is important for Lesser Kestrel, for example in Extremadura, where there is a unified management plan for all urban SPAs designated because of the presence of Lesser Kestrels. Finally, the law also allows for the development of action plans where two or more species share conservation problems, risks, habitat, etc. To this end, Lesser Kestrel is included in the 2003 Action Programme for the Conservation of Steppic Birds in Andalusia. Whilst not specifically targeted in the 2011 Andalusian Regional Government plan for the recovery and conservation of steppic birds, it is one of the species to benefit from actions to protect the 'umbrella species' that are listed. On the other hand, reforms of the Natural Heritage and Biodiversity Law in 2018 are widely seen as a step backwards, especially around the release of non-native species for fishing and hunting (Real Decreto 439/1990; DG Patrimonio Natural y Biodiversidad, Murcia, 2010; Consejo del Gobierno, 2011; Real Decreto 139/2011; (Yuste, Calzada and Román, 2011); SEO/BirdLife, 2016; SEO/BirdLife, 2018; Junta de Extremadura, undated; Redbag, undated).

Measures taken and their effectiveness

In addition to action plans, there is a long history of action to benefit this species in Spain. The following conservation measures were reported for Lesser Kestrel between 2008 and 2012.

Application of conservation measures for Lesser Kestrel for 2008-2012 in Spain

Measure	Type	Ranking	Inside/outside N2k	Broad evaluation
2.0 - Other agriculture-related measures	Administrative Recurrent	Low	Inside	Not Evaluated
2.1 - Maintaining grasslands and other open habitats	Administrative Recurrent	Medium	Inside	Not Evaluated
2.2 – Adapting crop production	Administrative Recurrent	Medium	Inside	Not Evaluated
6.1 - Establish protected areas/sites	Legal Administrative	High	Both	Maintain Enhance Long-term
6.3 - Legal protection of habitats and species	Legal Administrative	High	Both	Maintain Enhance Long-term
7.0 - Other species management measures	Administrative One Off	Low	Inside	Not Evaluated
7.4 - Specific single species or species group management measures	Administrative One Off	High	Both	Long-term
8.2 - Specific management of traffic and energy transport systems	Administrative Recurrent	Medium	Both	Long-term
9.1 - Regulating/Management exploitation of natural resources on land	Administrative One Off	Medium	Inside	Not Evaluated

Source: Spanish Article 12 report 2013 at <https://bd.eionet.europa.eu/article12/summary>

With over a third of the national population, Andalusia provides the best illustration of successes in conserving Lesser Kestrel until 2012. The Andalusian Region's Department of Environment and Land-use Planning (CMAyOT) actively built up a biodiversity team during the years 2002–04, including a fauna monitoring team in 2004. This was motivated both in reflection of indigenous interest in wildlife and to coordinate with national activity and monitoring programmes. Bringing this group of people together produced a critical mass which led to the identification of several priorities for Andalusian biodiversity, including steppic birds. As a result, work on the development of a conservation plan began, and in seeking ways to tackle the pressures steppic birds faced, the idea of applying for financial support through a LIFE project was hatched. The wider policy context was changing at the same time. The 2007 Natural Heritage and Biodiversity Law came into force and the proposal and, in 2008, designation of Natura 2000 sites was underway, which produced an anxious reaction in the agricultural areas involved. Having gained political support, these CMAyOT work-streams became the LIFE08 ZEPA Esteparias Andalucia project [ZEPA = SPA] and the 2011 'plan for the recovery and conservation of steppic birds' (Yuste, Calzada and Román, 2011); CMAyOT, 2014a; de las Heras pers comm, 2018, Garrido pers comm, 2018).

As outlined in the previous section, several other Regions of Spain produced action plans during this period, and as Annex II shows, there were five Spanish LIFE projects benefitting Lesser Kestrel between 1996 and 2000 and three in the period 2006–2012, (and there are two ongoing).

In Andalusia, regionally important areas for steppic birds have been designated and are protected even though they are not included within the Natura 2000 network. Planning regulations are used to mitigate the effects of proposed developments in these areas, just as they are within other protected sites (de las Heras pers comm, 2018).

Measures relating to habitat and engagement of agricultural communities

The measure that had the biggest positive impact on Lesser Kestrel, and the whole steppic birds guild, was the maintenance of stubble fields and the use of direct drilling (CMAyOT, 2013). A strong link to the set-aside policy has more recently emerged. This is because fallow fields (known locally as '*barbechos*'), have a relatively high floral diversity and insect biomass, and thus provide good foraging habitat. The CAP stopped funding set-

aside in 2007/2008, and the area of fallow fields in Andalusia reached a peak of 3.6 million ha in 2007. Coverage fell steadily back to 2.7 million ha in 2014, but during the 2008–12 Article 12 reporting period, the area covered was similar to 2004–05 levels until 2010 and only about 6% lower in 2011–12. Consequently, the Lesser Kestrel population remained high until around 2012.

The designation of SPAs in the farmed environment in 2008 led to anxiety among rural people, who were uncertain how this measure would impact them. One of the principal motivations and successful achievements of the LIFE ZEPAs project in Andalusia was to address these concerns and bring the agricultural community on board with conservation actions. The Regional Ministry of Agriculture and provincial bodies representing agricultural interests were associate beneficiaries of the project. Trusting relationships were developed through face-to-face dialogue, training and dissemination activities, and, through farmers being directly involved in the development and management of conservation measures. Within the SPAs, a number of legal agreements were signed around the management of farmland in ways that are beneficial for Lesser Kestrel and other steppe birds. This approach to local engagement was successful even in areas where the SPA had been most controversial, and engagement continues, albeit less intensively since the LIFE project ended. CAP funded agri-environmental measures were found to be less useful (since set-aside requirements ended), because of the small size of the farms and administrative barriers to participation. Landowners outside of the SPA network were also approached and encouraged to adopt positive measures if they were willing (CMAyOT, 2014a; de las Heras, 2018).

Measures relating to nest sites

Lesser Kestrels nest primarily in buildings. For much of the last century, the number of suitable nest sites declined, partly as old buildings in rural areas fell into ruin and partly as rooves in urban areas were repaired or replaced in ways that kept Lesser Kestrels out.

This process has been addressed in several ways:

- the construction of buildings '*primillares*' in rural areas specifically for Lesser Kestrels nesting;
- the addition of artificial nests to existing constructions such as silos, electricity transformers and tall urban buildings;
- making repairs to abandoned rural buildings with important colonies; and
- legal controls on the timing and method of roof repair and replacement work.

Constructing '*primillares*' (from *primilla* the Spanish name for Lesser Kestrel), which provide a new building designed to attract the species and ultimately become a new colony has been tried at various sites across Spain. Four were constructed in Andalusian SPAs as part of the LIFE ZEPAs project and six others were constructed under the auspices of the CMAyOT in other parts of the region. All these *primillares* have been occupied by at least a few pairs within the first few years. Those built in Cádiz Province from 2007–09, have been very successful, with numbers in Cádiz rising from 42 pairs in 2004 to 91 in 2012 and 108 in 2017 (CMAyOT, 2014a; de las Heras pers comm, 2018).

The Grupo para la Rehabilitación de la Fauna Autóctona y su Hábitat (GREFA) has run a 'Corridors for Lesser Kestrels' project since 2006. By 2012, this project alone saw the installation of over 2,000 artificial nests across the regions of Andalusia, Castilla-La Mancha, Extremadura and Madrid, with the backing of national and regional governments. They achieved an occupancy rate around 50% and enabled the establishment of 30 new Lesser Kestrel colonies (GREFA, 2012). The project since has continued with 613 nest boxes installed along the A-6 road through Castilla y León, and the financial backing of the Fundación Banco Santander (Fundación Banco Santander, 2016). Other organisations have developed similar projects, notably the Sociedad Ibérica para el Estudio y Conservación de los Ecosistemas (SIECE), working in Jaén Province, Andalusia, where the number of pairs rose from 98 in 2004 when the project started to 310 in 2012, though they have fallen back to 85 pairs in line with the recent regional trend (de las Heras pers comm, 2018; SIECE, undated).

In either of the above cases, the artificial nests can be occupied by other species – sometimes welcome from a conservation perspective, but also common species like Spotless Starlings (*Sturnus unicolor*) and domestic pigeons, which in turn, can spread parasites (GREFA, 2012; CMAyOT, 2014a; Murcia.com, 2018).

The abandonment and subsequent collapse of farmhouses, stables and other rural buildings is a very significant factor in the loss of nest sites in Spain (CMAyOT, 2014b). In parallel with artificial nests and new constructions, buildings with existing colonies have been repaired to prevent their collapse, for example, in Murcia (Hernández Piñera, 2010; murcia.com, 2018).

Regulation of the repair and replacement of buildings in which Lesser Kestrels nest is an important tool in the protection of existing colonies. Lesser Kestrels favour relatively tall buildings with rooves, which tends to mean that urban homeowners are unaffected. The regional governments use their development planning and control powers to prohibit and halt works during the breeding season and to ensure that works are designed in ways that allow the species to continue to nest. For example, works on the roof of Seville Cathedral were directed by CMAyOT and suspended for the breeding season (CMAyOT, 2014b; de las Heras pers comm, 2018; Junta de Extremadura, undated). The first urban SPA in Europe was designated for its Lesser Kestrel colonies in Almendralejo, Extremadura in 2004. Further SPAs to protect urban nesting colonies have since been declared in Extremadura and a LIFE project on the network of urban SPAs in the region followed in 2015 (EC, 2015; LIFE programme database).

Measures relating to energy and transportation infrastructure

Measures have been taken to reduce the incidence of collision with powerlines and electrocution, mainly of birds perched on low or medium voltage pylons both before and since becoming mandated by Spanish Law with the Real Decreto 1432/2008 in August 2008. This activity primarily targets larger raptors, vultures and storks, but also reduces the incidence of this type of mortality seen among Lesser Kestrels, especially juveniles. For example, in association with Iberdrola and the Confederación Hidrográfica del Segura, the LIFE funded Tendidos Electricos Murcia project changed, during the period 2008–10, over a thousand pylons located in SPAs in Murcia to designs that minimise the risk to birds (Consejería de Presidencia, 2011; CMAyOT, 2014b).

Lesser Kestrels can be discouraged from feeding around turbines by ploughing to reduce the availability of their favoured Orthopteran prey (University of Salamanca, 2016).

Other measures

Increased monitoring is essential to prioritise conservation action. Across Spain, the autonomous regions greatly increased efforts in this area in advance of and during the 2007/2008–2012 Birds and Habitats Directives reporting periods. As noted above, monitoring (as well as conservation plans) are required by law for any species classified nationally or regionally as ‘Sensitive to habitat change’, Vulnerable, or Endangered (Hernández Piñera, 2010; Yuste, Calzada and Román, 2011); de las Heras pers comm, 2018).

Lesser Kestrel was extirpated from the regions of Catalunya and Valencia towards the end of the 20th Century. Reintroduction programmes based on captive-bred birds have been used to re-establish the species during the first decade of the 21st Century (Hernández Piñera, 2010).

Funding sources (current and long-term) and costs (one-off and ongoing)

Regional government funding has been critical to the conservation and monitoring of Lesser Kestrel and steppic birds across Spain. This includes finance for all types of activity including artificial nesting site work, engaging with farmers, development planning and control, elaborating legislation, developing and implementing conservation plans, and, biological monitoring. National government funds have also been used in respect of legislature, activities in national parks and some specific projects.

NGO time and funds have been important for many specific projects (GREFA, 2012; eldiario.es, 2016; Murcia.com, 2016; de las Heras pers comm, 2018; SIECE, undate).

An important indirect source of funding was the CAP as from 1992 to 2007/8 farmers were required to set-aside a proportion of their land in order to receive payments. This habitat was among the favoured hunting territories for Lesser Kestrel, and the policy and its subsequent removal may be a significant contributor to the trends observed in the species’ population in Spain (CMAyOT, 2014b). Farmers and landowners contribute their resources in taking part in conservation management measures, which have been vital in the Andalusian SPA network (CMAyOT, 2014a; de las Heras pers comm, 2018).

LIFE funding has been provided for projects listed in Annex II, notably contributing 55% of the €8.6 million total budget for the LIFE ZEPA esteparias project in Andalusia. Red Eléctrica de España, ENDESA and Fundación ENRESA (all related to electricity production or transmission) co-financed this project (CMAyOT, 2014a). LIFE funds have continued to be used, with the ongoing LIFE – ZEPAURBAN project, which targets Lesser Kestrels nesting in 19 towns and cities in Extremadura, receiving over €2 million towards a total budget of €2.8 million (LIFE programme database).

The European Regional Development Fund has been used to improve the monitoring of steppic birds, for example in Murcia (Hernández Piñero, 2010).

More recently (post-2012), private companies have funded projects supporting the species, notably the Fundación Banco Santander and Fundación Iberdrola España (Fundación Banco Santander, 2016; University of Salamanca, 2016).

Future actions and actions since 2012

A new high speed train route between Seville and Huelva is being constructed. This passes near one of Andalusia's regionally protected areas for steppic birds, and through its Environmental Impact Assessment, conditions have been imposed to minimise the impact on the site (de las Heras pers comm, 2018).

Through the LIFE ZEPA esteparias project, four new *primillares* were built and two others converted from old electricity substations, and four rooves were adapted or had nest boxes added, across the provinces of Sevilla, Córdoba and Málaga (CMAyOT, 2014a; de las Heras, 2018).

A collaboration between the Ministry of Agriculture, Food and Environment, GREFA, the Junta de Castilla-La Mancha, the Instituto Tecnológico de La Marañosa (linked to the Ministry of Defence), the Spanish National Parks Network and a Madrid Regional Park constructed three *primillares* in 2016, and populated them with 150 chicks from two rehabilitation and breeding centres, either directly rescued or bred in captivity from rescued birds. The chicks are fed at the nests. Combining this 'hacking' technique with nest site construction is seen as experimental (eldiario.es, 2016; Gómez Manzanque, 2016), and presumably aims to address the slow process of occupancy sometimes experienced in *primillares*.

LIFE ZEPAURBAN is addressing issues at urban nesting colony sites in Extremadura, improving the foraging areas in their rural hinterland, raising public awareness and linking in with the tourism sector (LIFE programme database).

The steep decline in the population since about 2012 is being researched urgently with a view proposing conservation measures such as agri-environmental subsidies. In terms of the current 2014-20 CAP and its Pillar 1 Greening Measures, it is thought to be unlikely that Ecological Focus Areas (EFAs), including increasing non-irrigated forage crops, will fully compensate for the loss of set-aside fields because such crop fields are not floristically diverse and it has been possible for insecticides to be used on them. However, the use of insecticides on EFAs is now banned. Furthermore, if EFAs were correctly and widely applied, they could present an opportunity to improve prey availability, and thereby compensate for, or even surpass, the effects of reduced set-aside hectareage (CMAyOT, 2014a; CMAyOT, 2014b; SEO/BirdLife, 2016; Garrido pers comm, 2018; de las Heras pers comm, 2018).

Achievements

Impacts on the target species

As a whole, in Andalusia, Lesser Kestrel numbers reached a modern peak during the 2008–12 Article 12 reporting period. Approximate numbers were as follows:

- 1988: 2,100 pairs
- 1995: 3,800 pairs
- 2005–2007: 3,800–4,250 pairs
- 2009: 4,800 pairs
- 2012: 5,050 pairs

In the Provinces of Cádiz and Jaén, Andalucía, 26 Lesser Kestrel colonies were supported or created through the construction of *primillares* or addition of artificial nests to churches, electricity substations, farmhouses etc. between 2004 and 2012. The number of pairs occupying those colonies rose from 140 in 2005 to 452 in 2012, although it had declined to 218 in 2017 (de las Heras pers comm, 2018).

The populations of Lesser Kestrels were stable in the period 2010–2012 in three of the four SPAs of LIFE Esteparias, but significant short-term declines (nearly 50%) were seen at Fuente de Piedra SPA (CMAyOT, 2014a).

Other impacts (e.g. other habitats and species, ecosystem services, economic and social)

The impact of actions to improve feeding habitat availability and prey density by definition has a positive impact on the wider ecosystem, particularly the insect and other invertebrate fauna (CMAyOT, 2014b).

Other species benefit from the construction of artificial nests and '*primillares*' including Common Kestrel (*Falco tinnunculus*), at least four species of owl (Strigiformes), European Rollers (*Coracias garrulus*), Jackdaws, Spotless Starlings, House Sparrows (*Passer domesticus*) and bats (GREFA, 2012; CMAyOT, 2014a; de las Heras pers comm, 2018).

The conservation of birds helps to support rural development as birdwatching tours are proving to be an additional boost to the economy in many parts of Spain (CMAyOT, 2013; CMAyOT, 2014a).

Conclusions and lessons learnt

The key targeted conservation measures that led to the improvements

The intertwined development of European, national and regional legislation, site protection, conservation action planning and monitoring worked towards a common goal and achieved positive impacts.

- Development planning and control has protected existing colonies in buildings across Spain, as well as nationally and regionally protected sites for steppe birds.
- The projects to replace the ongoing loss of nesting cavities in old buildings with artificial nest site provision has largely been successful.
- Although not a targeted action, the CAP requirement for set-aside from 1992 until 2007/8 increased the area of fallow and given this is one of the species' preferred habitats, it is likely to have contributed to the recovery of the population at the time.

Conservation measures that have not been sufficiently effective

- The steep decline in the species' population since around 2012 indicates that some measures have lacked durability. This may reflect changes in the Spanish agricultural environment or in the wintering range.

Factors that supported the conservation measures

- Working with the owners and farmers of land within the Natura 2000 network has yielded a collaborative approach to the successful conservation of foraging habitat for Lesser Kestrels.
- The use of Lesser Kestrel as one of a group of birds occupying similar habitat to address multiple species conservation.

Factors that constrained conservation measures

- The abolition of set-aside in 2007/8.

Quick wins that could be applied elsewhere for the species

- The use of specially designed buildings (*primillares*), nest boxes and adaptation of rooves yields rapid results, with many becoming rapidly occupied, at least while the population was growing.

Examples of good practice, which could be applied to other species

- Close collaboration with the agricultural sector over conservation measures in the rural environment (this was actually for several steppe birds, not just Lesser Kestrels, but could be applied to other agricultural habitats and species).

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Authorship

Prepared by Tom Stuart of IEEP, as part of the European Commission study on identifying the drivers of successful implementation of the Birds and Habitats Directives (under contract ENV.F.1/FRA/2014/0063), carried out by the Institute for European Environmental Policy, BirdLife International, Deloitte, Denkstatt, Ecologic, ICF Consulting Services and PBL Netherlands Environmental Assessment Agency.

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Annex 1 Lesser Kestrel conservation status at EU and Member State levels

Increasing	+	Stable	0	Unknown	x	Decreasing	-	Fluctuating	F	Uncertain	U
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	Breeding population				Breeding range			
	Short-term		Long-term		Short-term		Long-term	
BG	2000-2012	-	1980-2012	-	2000-2012	-	1980-2012	-
CZ								
ES	1998-2011	+	1980-2012	+	2001-2012	0	1980-2012	-
FR	2001-2012	+	1980-2012	+	2000-2012	+	1985-2013	+
GIB	2000-2012	F	1980-2012	-	2000-2012	0	1980-2012	0
GR								
IT	2000-2012	+	1993-2012	+	2002-2013	+	1983-2013	+
PT	2001-2012	+	1990-2005	+	2001-2012	0	1990-2012	+
RO	2001-2013	0	1980-2012	-	2001-2013	0	1980-2012	-
SI	2001-2012	0	1980-2012	-	2001-2012	x	1980-2012	-

Source: Member State Article 12 reports as compiled by ETC-BD on EIONET

<http://bd.eionet.europa.eu/article12/summary>

Annex 2. LIFE Nature Projects in Spain that aimed to help conserve Lesser Kestrel

Project Title	Project N°	MS	Type Of Beneficiary
ZEPAS/Extremadura - Preservation of the Little Bustard, Great Bustard and Lesser Kestrel in Extremadura	LIFE96 NAT/E/003102	ES	Regional authority
Falco naumanni/Villaffila - Conservation Lesser Kestrel (Falco naumanni) in the S.P.A. Villaffila	LIFE99 NAT/E/006341	ES	Regional authority
Falco Aragón - Conservation of Falco naumanni nesting habitat in Aragon	LIFE00 NAT/E/007297	ES	Regional authority
Serena - Tiros - Habitat management model of the SCI La Serena - Sierra de Tiros (Extremadura, Spain)	LIFE00 NAT/E/007327	ES	NGO-Foundation
ZEPA La Serena - Management of the PSA-SCI 'La Serena y Sierras periféricas'	LIFE00 NAT/E/007348	ES	Local authority
Tendidos Electricos Murcia - Correction of Dangerous Overhead Cables in Special Protection Areas for Birds in the Region of Murcia	LIFE06 NAT/E/000214	ES	Regional authority
ZEPA ESTEPARIAS ANDALUCIA - Conservation and management of special protection areas for steppe birds in Andalusia	LIFE08 NAT/E/000068	ES	Regional authority
LIFE "Oeste Ibérico" - Landowners Club for the conservation of Western Spain	LIFE12 NAT/ES/000595	ES, PT	NGO-Foundation
LIFE STEPPE FARMING - SUSTAINABLE FARMING IN SPAs OF CASTILLA-LA MANCHA FOR STEPPE BIRDS CONSERVATION	LIFE15 NAT/ES/000734	ES	NGO-Foundation
LIFE- ZEPAURBAN - Management of Urban SPAs in Extremadura for the conservation of Lesser kestrel (Falco naumanni)	LIFE15 NAT/ES/001016	ES	Regional authority

Source: Life Programme database, projects with species = 'Falco naumanni'