

Fostering the breeding range expansion of Central-Eastern Mediterranean **Lesser Kestrel populations**

LAYMAN'S REPORT



LIFE17 NAT/IT/000586

The Project Identity

Title:
Fostering the breeding range expansion of central-eastern Mediterranean Lesser Kestrel Populations

Acronym: LIFE FALKON

EU Code: LIFE17 NAT/IT/000586

Project areas: Italy, Greece

Start date: 01/07/2018

End date: 31/12/2023

Project Duration: 66 months

Total budget: 1,724,304 €

EU contribution: 1,103,064 €

Fondazione Cariplo: 110,000 €

Green Fund: 10,000 €

Project Coordinator: CNR-IRSA Consiglio Nazionale delle Ricerche - Istituto di Ricerca sulle Acque, Italy

Project partners:
University of Milan, Italy
ISPRA, Istituto Superiore Protezione e Ricerca Ambientale, Italy
Hellenic Ornithological Society/ BirdLife Greece
ALDA - Associazione delle Agenzie della Democrazia Locale, Italy / France

 **Project website:** www.lifefalkon.eu
Facebook: Life Falkon
Twitter/X: @lifefalkon



LIFE Nature and Biodiversity is one of the main strands of the European Union's funding programme for the environment. It supports projects that contribute to the implementation of the EU's Birds and Habitats Directives, the Natura 2000 network and that contribute to the EU's goal of halting the loss of biodiversity.



Natura 2000 is an EU-wide network of nature protection areas established in 1992. The network aims to assure the long-term survival of Europe's most valuable and threatened species and habitats. It comprises Special Areas of Conservation (SAC) designated by Member States under the Habitats Directive, and also incorporates Special Protection Areas (SPAs) designated under the Birds Directive. The Project has been implemented in 12 Special Protected Areas in Italy and Greece.



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Fostering the resilience of the central-eastern European population of Lesser Kestrel to climate change

Objectives

The LIFE FALKON project aims to foster the resilience of the central-eastern European population of Lesser Kestrel to climate change, by improving the conservation status of Italian and Greek populations breeding at the north-eastern edge of the breeding range.

Specific objectives are to:

- Improve foraging and nesting habitat quality in farmland areas and Natura 2000 sites (SPAs) where the species breeds in the project areas;
- Establish a collaborative international network to support the implementation of conservation actions, population monitoring programmes and knowledge sharing across the central-eastern Mediterranean region, and foster replicability and transferability of project actions in south-eastern Europe;
- Promote public awareness concerning the lesser kestrel and biodiversity conservation in the north-eastern margins of its breeding range, with an emphasis on environmental education;
- Obtain an accurate assessment of the conservation status of those populations that are considered crucial for the species' northward breeding expansion.

The project directly implements the Birds Directive, by targeting a species that is listed as a conservation priority.



The Lesser Kestrel

The Lesser Kestrel (*Falco naumanni*) is a small, elegant and slender falcon, with rather narrow and pointed wings and a long tail.

It is approximately 30 cm long from head to tail, with a wingspan of 60-70 cm and a weight that varies from 90 to 200 grams. Contrary to what one might think, the female, with its average weight of 160 g, is larger than the male, which weighs only 140 grams on average.

Apart from the size difference, male and female Lesser Kestrels broadly differ from each other regarding their looks. The male has brighter colours. Its head is slate grey, as well as its tail, which also has a large black band at the end; the back is reddish-brown, while the chest and belly are cream-coloured, with small black heart-shaped spots. The female, on the other hand, has a less conspicuous plumage, with light brown upper parts barred with black and light and heavily spotted underparts. The young Lesser Kestrels look like females and the males start developing their characteristic plumage from the second year of their life.



COMMON KESTREL



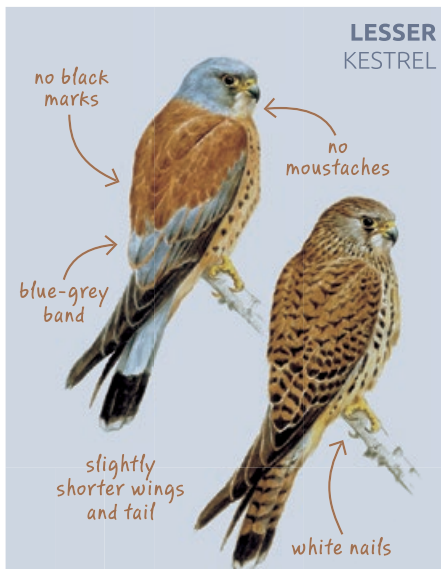
Differences with the Common Kestrel

There is a very strong resemblance between the Lesser and the Greater White-fronted Goose that is a much more abundant species whose hunting is allowed in most of its range.

A species that can commonly be confused with the Lesser Kestrel is the more abundant and widespread Common Kestrel (*Falco tinnunculus*).

The Common Kestrel can be found in almost every habitat, from high mountains to coastal areas and from city centres to farmlands. Nevertheless, it is not colonial (apart from some rare occasions) and is also present year-round in our region.

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Main external differences between the males of the two species are the absence of "moustaches" and of black marks on the back in the Lesser kestrel males, as well as a blue-grey band that crosses the upper side of the wings.

The females of the two species are very similar and can be distinguished only by observing small details, such as the colour of the nails (white in the Lesser Kestrel, dark in the Kestrel) and the relative length of wings and tail.

Lastly, a safe way to discriminate between the two species is by sound. The call of the Lesser kestrel is unmistakable: a "check-check-check" emitted mainly at the colonies and used to communicate with the partner and to signal the presence of an intruder.

A small falcon that lives close to humans

Nesting and Reproduction

The Lesser Kestrel nests in colonies made up of a variable number of pairs, from one to some hundreds, but almost always in close proximity to humans. In some areas a colony can be limited to a single building while in others it can be spread over a whole town. Only a handful of colonies are found to exist in more "natural" nesting sites, such as rock faces, islets and abandoned quarries, away from any human presence.



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The pairs always prefer to nest close to each other. This is not to say that competition for nesting cavities is not fierce; birds that arrive earlier at the colony in the spring are more likely to find a better nest to raise their offspring. The nests are simple hollows inside cavities in walls, roofs or rocks with no material added by the birds for protection. While generally preferring nesting sites with narrow and long tunnel-like entrances,

sometimes the Lesser Kestrels can also occupy small shelves or crevasses, easily assessed and barely sheltered from the weather or potential predators.

Pairs are formed in early spring and their bond lasts throughout the breeding season. During courtship, the male offers prey to the female. Egg-laying takes place between the end of April and the beginning of June; the exact date can vary from year to year according to the temperatures that the individuals find upon arrival at the colonies. The eggs, usually 3 to 5, are incubated by both parents until hatching, which takes place after about a month. The eggs of the same nest hatch over several days; for this reason, some siblings are often smaller than the others and do not always manage to reach adulthood.

The number of chicks that survive until fledgling depends largely on the availability of resources around the colony and on atmospheric conditions. Both cold spells at the end of spring and intense heat waves, such as those that occur more and more frequently, claim many victims.



About 6-8 weeks after leaving the nest, the young falcons are ready to follow their parents and other adults along their migratory routes. They will return to the colony the following year or two years later, to form their own new family.

The Lesser Kestrel mainly feeds on large insects, such as crickets, grasshoppers, locusts, mole crickets and beetles.

The Lesser Kestrels identify their prey using the “hovering” technique, i.e. by remaining still in the air, or by observing the surrounding area from raised perches, such as poles, electric cables and buildings. They can also catch insects in flight.

Habitat

The species mainly occupy warm and dry open habitats with low or sparse herbaceous vegetation, such as cultivated plains and pseudosteppic or semi-desert areas. It prefers flat or hilly lands up to about 500 m of altitude. The breeding sites are located where there are both hunting grounds rich in prey, and suitable nesting sites such as human settlements, individual buildings or rocky outcrops. Human disturbance is not a problem for the Lesser Kestrel, as long as it is not excessive.

The Lesser Kestrel breeds in southern Europe, North Africa and central Asia. In the Mediterranean it is found in almost every country, but its main strongholds are Spain (which is home to about half of the European population), Portugal, Italy, Greece, Turkey and Morocco.

A map of Europe and North Africa showing the distribution of the Iberian lynx. Red shaded areas indicate the species' range, primarily in southwestern Spain and northern Morocco. A scale bar (0-1,000 km) and a north arrow are in the bottom right. A cartoon lynx head is in the top right corner.

Lesser Kestrel migration routes

The Lesser Kestrel is a long-distance migratory species. Most individuals spend the winter in sub-Saharan Africa, although some stop in southern Europe or North Africa or reach southern Asia.

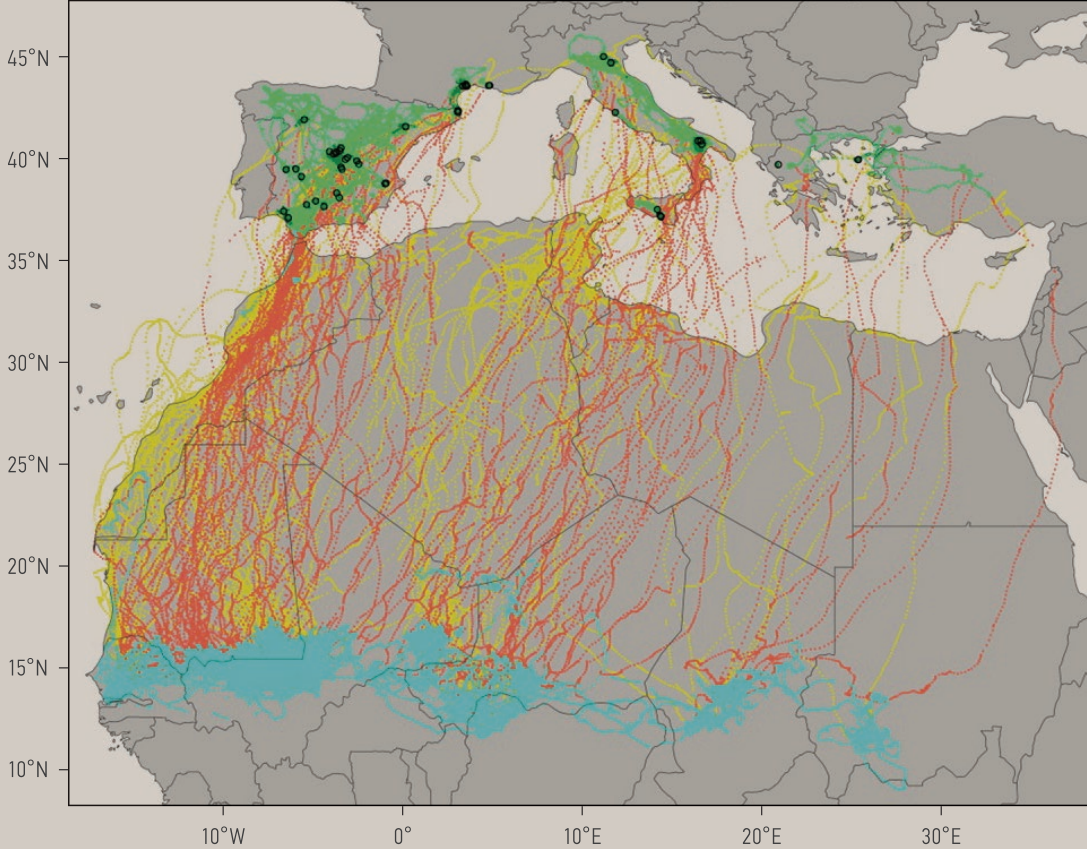
Spring migration begins in February and the falcons reach their nesting sites between late February and early April. Immediately after reproduction, between the end of July and August, the Lesser Kestrels leave the colonies to reach the premigratory fattening areas, often gathering in large groups for the night. Autumn migration begins at the end of August and lasts until November.

The Lesser Kestrel is a philopatric species, which returns from year to year to the same site to nest. Juveniles also tend to return to or very close to their original colony to reproduce.

During the LIFE FALKON project more than 30 satellite transmitters were deployed on birds from Greece and Italy, in order to study their movements. The results were astounding, as the birds showed how capable they are of covering great distances with speed and accuracy.

PHASE

- Pre-breeding migration
- Post-breeding migration
- Non-breeding phase
- Pre-migratory phase
- Breeding phase



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Lesser Kestrel wintering grounds

Although some individuals remain to overwinter in Spain, southern Italy, southern Turkey and Malta, the species is typically a long-distance migrant with wintering quarters in sub-Saharan Africa, mainly in a "latitude belt" across Senegal, Mauritania, and Mali, approximately 2800 km from their breeding sites. The birds are drawn there due to the plentiful locusts and grasshoppers in the Sahel region. Research suggests this may be the most important wintering area for European Lesser Kestrels.

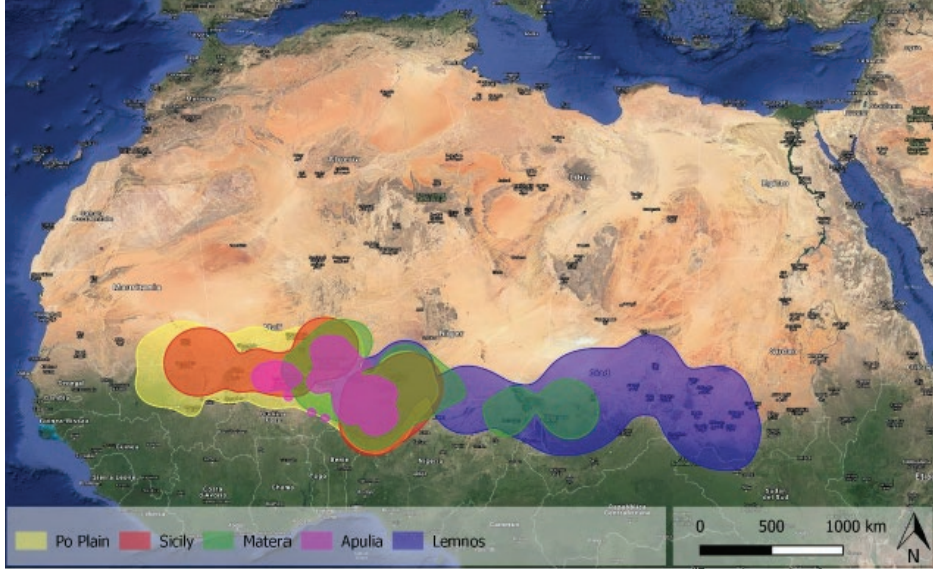
Birds from eastern Europe and Asia, on the other hand, concentrate in southern Africa: Botswana, Namibia, and South Africa. Their preferred wintering habitat there, varies depending on food availability. They favour open areas with short vegetation like savannahs, grasslands, and agricultural land.

Lesser Kestrels often gather in large groups called communal roosts, sometimes numbering hundreds or even thousands of individuals. This behaviour helps them conserve body heat and stay safe from predators.

Protecting these wintering grounds is crucial for the Lesser Kestrel's survival, as threats like habitat loss and pesticide use can significantly impact their populations. Augiron et al. (2015) estimated that in a central area of Senegal of 17,000 km², in the period 2009-2013, 36,000 individuals wintered, representing 50% of the European population.



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During the telemetry studies we had the opportunity to discover exciting details regarding the wintering grounds of Lesser kestrels. It seems that the birds originating from different geographical longitudes, occupy different areas in the Sahel region. Of course, these areas might overlap a bit, but as you can see in the following map, they are quite distinct.



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Pressures & Threats

Since the second half of the 20th century, the world population of the Lesser Kestrel has undergone a marked demographic decline, particularly in Europe, which has seen a 90% reduction in the number of pairs in a few decades. Starting from the 2000s, the species began a slow recovery, which also led it to colonise new areas, such as the Po Valley.

The main threats affecting the Lesser Kestrel in the nesting areas are the reduction of hunting habitats due to climate change, the intensification of agriculture and agricultural transformations towards less suitable crops for the species, urbanisation and

reforestation; the reduction of prey and poisoning due to the use of pesticides; the loss of nesting sites due to the demolition or renovation of old buildings, or human disturbance. Minor, but still important, are collisions with power lines and wind farms, and poaching.

The anticipated effects of climate change on Lesser Kestrels suggest positive outcomes in the short term but raise concerns over the long term. Theoretically, climate warming creates conditions conducive to the northern expansion of the breeding range for Lesser Kestrels in pseudo-steppe Mediterranean habitats. Actually, Lesser Kestrels in the western Palearctic are exhibiting a northward expansion in their breeding range, a clear response to ongoing climate change. However, predictions for 2070 indicate a potential contraction in suitable breeding areas, primarily due to alterations in rainfall patterns and temperature seasonality. This forecasted shrinkage underscores the complexity of the impact climate change may have on the long-term viability of Lesser Kestrel populations.



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Project areas

The LIFE FALKON project implemented conservation & awareness actions in 16 Natura 2000 sites in Italy (9) and in Greece (7).

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x9

In Italy:

Project actions in Italy were all implemented in central-Eastern Po Plain, a wide Project Area that includes all the local population of Lesser Kestrel and several Natura 2000 sites. Nine (9) of these sites were targeted with practical interventions through the installations of nestboxes and nesting towers and awareness actions were implemented in schools and with stakeholders of specific towns & villages of the Project Areas.

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x7

In Greece:

In Greece, activities spread over three different Project Areas: Lemnos island (Northern Aegean), area of Ioannina in Epirus, area of Komotini as well as lakes and lagoons of Thrace (Northern Greece). On these sites, we implemented conservation and dissemination actions, targeting seven (7) Natura 2000 sites.

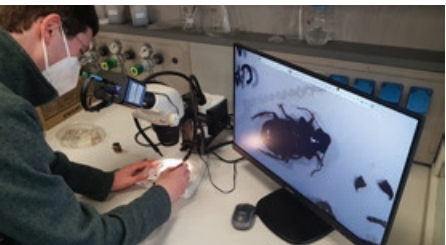


What did the LIFE FALKON project do?

The LIFE FALKON project implemented a series of conservation, monitoring, communication and education actions in northern Italy and Greece.



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- Assessed the conservation status of the Lesser Kestrel.** Updated information on the population status of Lesser Kestrel was collected during the breeding seasons 2019-20 and in the next years these populations were constantly monitored. Moreover, the LIFE FALKON team was able to discover some previously unknown colony sites during its fieldwork activities.
- Developed technical blueprints for the construction of nesting towers and for nestboxes.** LIFE FALKON worked on developing a set of nestbox models suited for Lesser Kestrels capable of being installed on either electricity poles or buildings. Additionally, LIFE FALKON developed "smart" nestboxes (suited for setting a video-recording system of the inside of the nest) and roof-adapted nestboxes. In the same period, engineers and ornithologists worked together to design nesting towers: small buildings of 5 m in height constructed to offer 22 safe nesting sites each and minimise the risk of nest predation while respecting the local architectural style.
- Installed nest boxes and nest-complexes.** LIFE FALKON installed more than 300 nests in Italy and Greece.

- Assessed the genetic similarity of Lesser Kestrel populations.** The Project brought together scientists from all over Eurasia to investigate the genetic differences between populations from different regions (from Iberia to Mongolia)
- Studied the migratory and wintering behaviour of lesser kestrels,** from several populations: Matera (Basilicata, this Project), Apulia and Sicily, for which available data existed from previous projects (Sarà et al. 2019). Additionally, data from two Greek populations (Ioannina, and Lemnos). We deployed with biologging devices over 60 Lesser Kestrels.



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- Nesting Towers were built** according to the blueprints defined within the framework of action A2. They are 5 m high, with a 3 x 3 m base. External holes allow birds to enter nest boxes placed inside the tower. Each tower hosts 22 nest boxes that can be easily inspected from the inside. Each tower was dedicated to a person who significantly contributed to nature conservation and avian research, with a link to the territory.
- Communication and dissemination material was produced and distributed.** Leaflets, postcards, booklets, banners as well as promotional materials were produced by LIFE FALKON, in an effort to communicate our conservation efforts to the general public. For the same reason, a series of articles, interviews and presentations were realised. A 15 min documentary was also produced.
- Stakeholders, local authorities, NGOs and scientists were involved.** LIFE FALKON produced a series of scientific papers (10 published to date), a handbook for enabling replicability and transferability of the project's achievements and also brought together the people working on the species throughout the Mediterranean building a dedicated CoI (Community of Interest).
- Produced a set of environmental education materials for schools** consisting of a comic book, a floor game, instructions for the teachers and educational activities. School visits from the LIFE FALKON team introduced the material to more than 2,000 pupils.
- Training seminars for farmers and architects took place** informing these target-audiences about the Lesser Kestrel and the threats it faces.



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Artificial nests

One of the major threats the Lesser Kestrel is facing today is the lack of suitable nesting sites. This is mainly due to the fact that less and less old buildings exist, since they often are renovated or demolished. The old, traditional buildings feature some characteristics that the lesser Kestrels love, such as loose tiles, roof openings and holes in the walls. The falcons, as well as several other species of birds, are taking advantage of the presence of such nesting opportunities.

There is no doubt that keeping buildings in a decaying status is something potentially dangerous for public safety and demolishing them can lead to the loss of important samples of traditional architecture. The best solution in order to protect both the lesser kestrels and our cultural heritage, is to renovate old buildings while at the same time keeping them bird-friendly. This can be achieved by installing nest boxes,



creating nest complexes or even by the construction of nesting towers, especially dedicated to host the Lesser Kestrels colonies. Of course, the same measures can be taken whenever an old building that was used by the falcons is being demolished or a new one is built. In this way, humans and Lesser Kestrels can continue to coexist in the future.

The LIFE FALKON Project implemented all these activities in the Project Areas in Italy and Greece and communicated their results in the local communities and the professionals occupied in the building sector.

Lesser Kestrel and farmers: a close cooperation

Since the Neolithic ages, many bird species have adapted to coexist with humans in rural contexts and have been appreciated for their usefulness in reducing mice and other pest species. The Lesser Kestrel is one of these species: a single pair can hunt up to 160 mole crickets or grasshoppers per day!

In the Po Plain it nests in isolated buildings and hunts in fields of alfalfa and cereal crops. Here it benefits from the Parmigiano Reggiano production Consortium, in which the use of pesticides and fertilisers is reduced, but in many areas it suffers from the reduction of agricultural practices and crops suitable for its sustenance, and from the lack or demolition of nesting sites. In Greece it nests colonially in the villages and towns and mainly exploits the food resources found in cereal fields.

In Po Plain, farmers can help Lesser Kestrel and other species bound to agroecosystems thanks to the new CoPSR measures of Emilia-Romagna Region, which will promote a more hospitable agricultural environment. In Greece, a set of eco-schemes are included in the CAP, in order to support the increase of biodiversity in agricultural ecosystems. Furthermore, many farmers have already allowed the installation of over 100 LIFE FALKON nest boxes, creating new safe nesting sites for this species.

In general, even in other areas, the maintenance of living grounds (herbaceous strips, hedges, etc.) between crops or along the perimeter of cultivated fields favours greater biodiversity, with cascading benefits on multiple species.



Joining Forces

The LIFE FALKON project has fostered collaborative initiatives with local conservation groups, even beyond the confines of the project's action areas. Transferability actions have been undertaken, such as providing nest box designs, consultative dialogues with volunteers to talk about monitoring methodologies and conservation strategies. In Lemnos (Greece), close cooperation with local organisations and environmental NGOs has been established, while at the same time the Project has been working closely with the management authorities of the Protected Areas where the Lesser Kestrel breed and forage.

When it comes to ornithological research and exchange of knowledge, LIFE FALKON Project was always

active, having participated in numerous international collaborative studies and research schemes. Also, the team of LIFE FALKON has been constantly in close cooperation with the other LIFE Projects that are working for the Lesser Kestrel in Europe.

In October 2023, in the island of Lemnos, LIFE FALKON organised the closing conference of the project. It was a great opportunity for all the researchers and conservationists working with the species to gather and share experiences and knowledge. Around 40 ornithologists from 8 countries participated in the conference, providing exciting new information through their presentations. This team of experts is going to keep on working for the conservation and research of the Lesser Kestrel in the future.



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Public awareness for the Lesser Kestrel

Project communication and dissemination activities were implemented on a broad scale throughout the project period focusing on multiple target groups, such as students, researchers, ornithological organisations, groups of interest, stakeholders and institutions.

A project website (www.lifefalkon.eu) was developed with the aim to disseminate information and project's results.

In fact, news and events, educational and communication materials are available to the whole community interested in the project (Languages available: English, Italian, Greek)

Furthermore, a set of useful information material was produced by LIFE FALKON, making knowledge more accessible to the public audience and throwing light to the threats the Lesser Kestrel is facing.



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Environmental education

The FALKON Project implemented a broad set of activities dedicated to the increase of environmental awareness of students as well as of teachers. In total, more than 2,000 pupils and 50 teachers were reached in Italy and Greece.

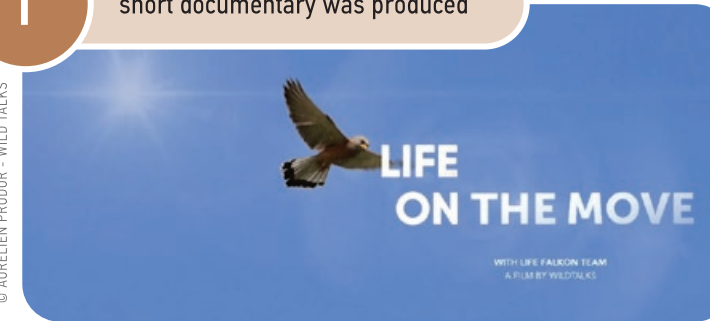
The dedicated environmental education package produced, included a floor game, a comic book, stickers and other fun and insightful ways that help children acquiring knowledge through playing and sharing experiences in the classroom.

Our biggest successes

1

short documentary was produced

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>2,000

pupils reached



1

market-based product was launched (the "Lesser Kestrel" beer)



530+

Lesser kestrels were tracked during their migration journeys.



13,188

ha were included into new IBAs in Italy

300+

nestboxes installed



10

research papers were published

1

International Conference in Lemnos was realised with the participation of 40 ornithologists from 8 countries

1

detailed genetic analysis of the species populations across Eurasia was conducted

5

nesting towers constructed



The project team



CNR:

Michelangelo Morganti (Project Manager), Andrea Sbrilli (Financial Coordinator), Alessandro Berlusconi, Alejandro Corregidor-Castro, Diego Copetti, Andrea Pirovano, Alessandro Mercogliano, Davide Scridel, Fabrizio Stefani

ISPRA:

Jacopo Cecere (Scientific Coordinator), Gaia Bazzi, Giacomo Assandri, Federico De Pascalis, Daniele Baroni, Jennifer Morinay, Simona Imperio, Riccardo Nardelli, Lorenzo Serra, Maurizio Miccinilli, Danilo Tomassini, Fabio Cianflone, Raffaele Lazzaro, Maria Angela Selvatici (Financial Coordinator)

Università degli Studi di Milano:

Diego Rubolini (Scientific Coordinator), Anastasios Bounas, Andrea Romano, Manuela Caprioli, Alessandra Costanzo, Roberto Zuffada (Financial Coordinator)

ALDA:

Alessia Marzotto (Communication Coordinator), Nadia Di Iulio (Unit Responsible), Elisabetta Pinamonti (Financial Coordinator), Raffaella Bedin (Financial Coordinator), Linda Maria Dal Bosco, Sofia Gatteri, Martina Adinolfi, Sofia Caiolo, Barbara Elia, Irene Negri, Irene Zanetti, Elisabetta Uroni

Hellenic Ornithological Society:

Nikos Tsiopelas (Unit Coordinator), Michalis Vafeiadis, Panos Kordopatis (Unit Responsible), Roula Trigou (Communication Coordinator), Aris Manolopoulos, Georgia Alexopoulou, Thanasis Koutsis, Stelios Pelasgos, Evgenia Panoriou, Lilia Bantikou, Lila Deroungieri, Dora Papaspyrou (Financial Coordinator), Thodoris Karakoulakis (Financial Coordinator), Angelos Evangelidis, Lefteris Kakalis, Tassos Bounas, Christos Barboutis, Victoria Saravia

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Project publications



Available in pdf:
<http://www.lifefalcon.eu/en/deliverables/>

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Editing / Texts:
Roula Trigou, Nikos Tsiopelas, Michelangelo Morganti, Alessandro Berlusconi & Gaia Bazzi

Graphic design:
Lila Simitzi - allsidea

Cover illustrations:
Paschalis Dougalis

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