

LESSER KESTREL BALKAN EXPERT WORKSHOP
Project: Better Life for Lesser Kestrel in South-East Balkans
LIFE for Lesser Kestrel LIFE19 NAT/BG/001017
Svilengrad, Bulgaria, 18-21 September 2022

ABSTRACT BOOK



Introduction

The workshop will provide a unique opportunity to exchange experiences among people involved in studying and managing Lesser Kestrel populations across Europe. Our aim is to share information about the species conservation status in the European Range countries and to build practical know-how about effective conservation measures that can be included in national and international species action plans. A special emphasis will be put on understanding the effects of land-use, and especially pesticide use, on Lesser Kestrel prey and the birds themselves. Furthermore, we plan to exchange hands-on experiences on technical issue, like breeding, hacking and tracking techniques. And of course, we also reserve some slots for any other interesting topics that might come up!

Organising Committee:

Green Balkans, Bulgaria

Hellenic Society for the Protection of Nature, Greece

University of Thessaly – Laboratory of Ecosystem and Biodiversity Management, Greece

Collaborating partnerships:

EuroNatur, Germany

DEMA, Spain

Svilengrad Municipality, Bulgaria

Historical museum – Svilengrad, Bulgaria

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2022

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LIFE for Lesser Kestrel LIFE19 NAT/BG/001017

SEPT
18-21
2022

Sunday 18.09.2022

Whole day	Arrival of the participants	Hotel Svilena, Svilengrad, Bulgaria
Whole day	Registration	Hotel Svilena, Svilengrad
Whole day	Uploading presentations, checking compatibility with the host software, installation of posters	Hotel Svilena, Svilengrad
20:00	Welcome dinner	Restaurant Mosta, Svilengrad

Monday 19.09.2022

08:00-9:00	Breakfast	Hotel Svilena, Svilengrad
09:00-09:15	Official opening	
09:15-09:45	Welcome speeches:	
	– Official representative of Municipality of Svilengrad;	
	– Gradimir Gradev, Project manager LIFE for Lesser Kestrel LIFE19 NAT/BG/001017	
	– Elena Miteva, Director of Historical Museum Svilengrad	
09:45-10:15	Guest lecturer: Pepe Antolín (Spain)	
	Prototype building to naturally breed a colony of <i>Falco naumanni</i> applying new releasing techniques	
10:15-10:45	Guest lecturer: Davide Scridel & Giacomo Assandri (Italy)	
	Potential threats posed by the wind power industry on the lesser kestrel: a continental-scale assessment	
10:45-11:15	Guest lecturer: Bourgeois Mathieu (France)	
	The new lesser kestrel actions plan in France (2021-2030)	
11:15-11:30	Coffee break	
11:30-11:45	Press conference	
11:45-12:30	Celebration of European Green Belt Day – Opening of Great Return Exhibition.	The lobby of the municipal administration of Svilengrad
13:00-14:00	Lunch	Restaurant Mosta, Svilengrad
	BULGARIA	
14:15-14:30	Gradimir GRADEV: Simeon Marin, Elena Kmetova-Biro: Action plan for the conservation of the Lesser Kestrel (<i>Falco naumanni</i>) in Bulgaria (2021 – 2030). Development, challenges and results	Hotel Svilena, Svilengrad
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14:45-15:00	Hristina KLISUROVA: PR activities in the process of the reintroduction of the Lesser kestrel as a breeding species in Bulgaria – promotion, educational initiatives, work with the media	
	Hristina Klisurova & Rusko Petrov	
15:00-15:15	Stefan DIMITROV: The Nature and Cultural-Historical Heritage in the Municipality of Svilengrad	



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LIFE for Lesser Kestrel LIFE19 NAT/BG/001017

SEPT
18-21
2022

GREECE

- 15:15-15:30** | **Eleftherios KAKALIS:** A GIS – Mapping approach for assessing habitat suitability for Lesser Kestrel (*Falco naumanni*) in North Greece
Hotel Svilena, Svilengrad
Eleftherios Kakalis, Konstantinos Vlachopoulos, Miltos Gletos, Chara Agaoglou
- 15:30-15:45** | **Athanassios SFOUGARIS:** Evaluation of the Lesser Kestrel population and habitat in Kilkis area, Northern Greece
Athanassios Sfougaris, Konstantinos Vlachopoulos, Maria Makri
- 15:45-16:00** | **Anna KAZAZOU:** Anima rehabilitation data
Anna Kazazou & Grigorios Markakis

16:00-16:15 | **Coffee break**

REPUBLIC OF NORTH MACEDONIA

- 16:15-16:30** | **Emanuel LISICHANETS:** Lesser Kestrel in North Macedonia

SERBIA

- 16:30-16:45** | **Slobodan MARKOVIC:** Observations of Lesser kestrel (*Falco naumanni*) in Serbia in the 21st century
Slobodan Marković, Vukas Vučković, Vladan Vučković

TURKEY

- 16:45-17:00** | **Murat DENİZ:** Lesser Kestrel in Turkey
Murat Deniz, Nigar Aldemir, Erdem Köse
- 17:00-19:00** | Celebration of European Green Belt Day 2022 Presentation of results from the Plein Air and the The Living Exhibition.
Part of European Heritage Days
- 19:00** | **Dinner**
Restaurant Mosta, Svilengrad

Tuesday 20.09.2022

- 08:00-9:00** | **Breakfast**
Hotel Svilena, Svilengrad
- 09:00-09:30** | Field trip to a mural depicting of Lesser Kestrels in Svilengrad
Svilengrad
- 10:00-11:00** | Field trip Lesser Kestrel Adaptation and Release Module in Levka
Levka
- 13:00-14:00** | Packed Lunch
Stara Zagora
- 14:00-16:00** | Field trip Wildlife Rehabilitation and Breeding Centre in Stara Zagora
Stara Zagora
- 18:00** | Arrival in Hotel Svilena
Hotel Svilena, Svilengrad
- 20:00** | **Dinner**
Restaurant Marica, Svilengrad

Wednesday 21.09.2022

- 08:00-9:00** | **Breakfast**
Hotel Svilena, Svilengrad
- 09:00-13:00** | Poster session
- 13:00-13:30** | Closing workshop
- 13:30-14:30** | **Lunch**
Restourant Marica, Svilengrad
- 14:30** | Departure
Hotel Svilena, Svilengrad
- 09:00** | Steering group meeting – Parallel meeting /Only members of group/
Hotel Svilena, Svilengrad
- Whole day**



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Asterisks (*) indicate the presenting authors.



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ALBANIA

Albania, an important roosting site for Lesser Kestrel (*Falco naumanni*)

Klea Duro¹, Erald Xeka¹, Taulant Bino¹

¹Albanian Ornithological Society, Vaso Pasha Street, Building No. 4, Entrance 2, Apartment 3, 1001, Tirana, Albania, e-mail: klea.duro@aos-alb.org

Albania shelters every year, from July to September, circa 6000-9000 individuals of Lesser Kestrel (*Falco naumanni*), or 3-4% of the global population of the species, during their pre-migration movements. These amounts of 6000-9000 individuals come from breeding populations of North Macedonia, Greece, Italy, Bulgaria, etc. There are eight roosting sites known in Albania so far, along valleys and planes mostly in the southern part of the country. The most notable one is Drino Valley with circa 3500-6000 individuals or 2-3.5% of global population.

Keywords: Albania, Lesser Kestrel, pre-migration, roosting site.

BOSNIA AND HERZEGOVINA

Recordings of Lesser Kestrel in Bosnia and Herzegovina in the 2012 – 2022 period

Biljana Topić¹ & Goran Topić¹

¹Ornithological Society Naše Ptice

The breeding status of the Lesser Kestrel (LK) in Bosnia and Herzegovina (B&H) is still unclear. Dr Saša Marinković (viva voce) claims that the Lesser Kestrel used to breed at 4 locations in Bosnia and Herzegovina, and in an internal publication for the project "Evaluation of IBA in FB&H." (Kotrošan et al. 2012) it is stated that the LK is the regular breeder with less than 10 breeding pairs in B&H. Neither of these two sources listed locations of the colonies or proofing photos.

No systematic research of the LK has ever been conducted in the B&H and the presented data on occurrence of this species in B&H during the 2012 – 2022 period are opportunistic results of different ornithological researches e.g., monitoring of birds for designation of new IBA sites. During this ten-year period, the species has been registered only during the spring and autumn migration. In total, Lesser Kestrel was recorded on 11 karst fields/ poljes, and on Mount Šator. The analysis of the seasonal dynamics of this species indicates that the species is rarely present in the spring, namely in April and May, when it was observed in the eastern parts of the country, in Mostarsko Blato and Zijemlje Polje. The earliest observation was on April 25 and the latest date of observation is 26.5.2012, when 6 individuals were observed in the Mostarsko Blato. From the beginning of August to the beginning of October, Lesser Kestrel was registered in 9 karst poljes (Glamočko, Kupreško, Kruško, Marinkovci, Pašića, Popovo, Ravanjsko, Vukovsko and Livanjsko) and on the slopes of Mount Šator. The earliest observation on autumn migration was on August 11 in Kupreško Polje, and the latest autumn observation is on October 5 in Popovo Polje. The only two so far known roosting sites were found in Kupreško Polje, in the villages of Zlosela and Rilić. The largest number of individuals, about 200, was counted on August 14, 2017 at the roosting site in Zlosela. On that day, birds were not counted at the other roosting site in Kupreško Polje so the total number of individuals on that day remains unknown. The 3 individuals of LK were marked with metal rings in Kupreško Polje in August 2022. The analysis of the spatial distribution of the foraging sites of LK in Kupreško Polje indicates that managed grasslands are the optimal feeding habitats.

It is still not known where the Lesser Kestrels which were observed in B&H are coming from, so future projects related to this species should include detailed surveys on the occurrence of LK, ideally using methods such as colour marking and telemetry, for investigating the origin and stop-over duration during premigratory dispersion and migration. It will be further necessary to carry out a synchronized count of individuals of this species in karst poljes, and to locate and map the most important feeding sites, as well as roosting sites with the aim of protecting them and reducing the negative impact on this species during migration.

Action plan for the conservation of the Lesser Kestrel (*Falco naumanni*) in Bulgaria (2021 – 2030). Development, challenges and results

Gradimir Gradev¹, Simeon Marin¹, Elena Kmetova-Biro^{1,2}.

¹Green Balkans – Stara Zagora. Bulgaria.

²Central European University, Quellenstraße 51, 1100 Wien, Austria.

Keywords: distribution, Lesser Kestrel, national population, recovery, reinforcement.

Lesser Kestrel (*Falco naumanni*, Fleisher, 1818) is listed as “Critically endangered” – CR in the Bulgarian Red Data Book (Barov et al., 2015). The national assessment is based on the IUCN Red List criteria and categories, comparable at international level. The main goal of the National Action Plan for the conservation of Lesser Kestrel is to improve the conservation and achieve a secure status of the species in Bulgaria, through nature conservation, education and information measures. Achieving the main goal requires the recovery / reinforcement of the population of the species until it reaches more than 250 adult individuals, distributed in more than distinct 5 colonies, geographically distant from each other. This is a key prerequisite for downlisting the species from “Critically endangered” to “Endangered”- EN in line with the Bulgarian Red Data Book, and reversing the trend of the national breeding population from „Decreasing” to „Increasing” in line with Article 12 of the Birds Directive.

The development of the Plan started back in 2012 with the preparation and submission of a Draft Terms of Reference to the MOEW and was only finalized in 2020 with a Designation Order issued by the Minister of Environment and Water. This is the first National Action Plan for the species, developed under the national legislation in Bulgaria and in line with the European Union Lesser Kestrel Action Plan (Iñigo & Barov, 2010). It is one of only 4 National Action Plans (Azerbaijan, Bulgaria, France, Italy) developed for the conservation of Lesser Kestrel worldwide (Sarà et al. 2021).

Two years after the start of the implementation of the Plan, one of its key objectives of reaching at least 5 distinct breeding colonies has almost been achieved. At least 4 nesting sites are currently known in Bulgaria – there are three confirmed nesting territories and an additional probable breeding site (Gradev et al. 2021).

The abundance and distribution of Lesser Kestrel after restoration in Bulgaria up to 2021

Gradimir Gradev^{1,2}, Simeon Marin¹, Svetla Dalakchieva³, Rusko Petrov⁴, Yordanka Vasileva⁴, Stilyana Yaneva^{1,2}.

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²Agricultural University of Plovdiv. Bulgaria.

³University „Prof. D-r Asen Zlatarov” – Burgas. Bulgaria.

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Keywords: distribution; Lesser Kestrel; national population; reintroduction.

*Article citation

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The Lesser Kestrel (*Falco naumanni*, Fleisher, 1818) is one of the rarest birds of prey in Bulgaria. In the past the species was widely distributed and numerous, but by the end of 20th century its number decreased significantly. In early 21st century, there were no confirmed data of breeding in the country.

In 2014 the nesting of the Lesser Kestrel was restored in Bulgaria by Green Balkans in collaboration with DEMA, and EuroNatur at the territory of “Sakar” SPA part of NATURA 2000. After 7 years of successful restoration of the species as a breeder in Bulgaria, in 2021 the national abundance was estimated more than 40 pairs, were formed in a minimum of four different nesting territories. There are three nesting territories with Confirmed breeding – “Sakar” SPA more than 25 pairs, Burgas region – “Lukoil Neftochim Burgas” AD maximum 10 pairs, and in the yard of Wildlife Rehabilitation and Breeding Center, town of Stara Zagora, managed by Green Balkans – minimum 5 pairs. One more place with the Probable breeding of the Lesser Kestrel we recorded in “Sakar” SPA or adjacent area – approximately 5 pairs. More than 25 pairs of the national population in this period occupied manufactured artificial nest boxes, with special design for this species according to methodology of DEMA.

This paper is in the frame of Project LIFE for Lesser Kestrel LIFE19 NAT/BG/001017, supported by Programma LIFE of the EU.

Life for the Lesser Kestrel and SAFSI

Hristina Grozdanova¹

¹Society of animalists florists and scientific illustrators – SAFSI

Art has its important role as an ambassador of ideas, as a way of working with a wide range of people and achieving a strong, lasting, emotional impact. One of the main goals of the Society of Animalists, Florists and Scientific Illustrators /DAFNI/ is to provide a field of work for artists, who find inspiration in wild nature. Through exhibitions in partnership with leading conservation organizations such as “Green Balkans”, the efforts and achievements of a variety of specialists become accessible, understandable and interesting when presented through the eyes and sensibilities of artists. The most recent art event dedicated to the Lesser kestrel is this year’s Plein Air, in which artists from SAFSI painted the endangered species to promote its conservation.

PR activities in the process of the reintroduction of the Lesser Kestrel as a breeding species in Bulgaria – promotion, educational initiatives, work with the media

Hristina Klisurova¹ & Rusko Petrov^{1,2}

¹Green Balkans – Stara Zagora NGO

²Trakia University, Bulgaria

The return of an extinct species to nature combines expert work in several directions – *ex-situ* and *in-situ* activities related to reproduction, breeding, fieldwork, administration, and PR.

They are all equally important and integral parts of the reintroduction activities, as a whole.

And, while the work of raising, breeding and field experts is about direct conservation activities, PR is about people. This can be both representatives of the local population, in whose area the direct conservation activities will be carried out, and a wider circle, including representatives of the media, and institutions, both in and outside the country in which the return of the species is being worked on.

The positive attitudes of the society, the knowledge of the problem and the understanding of the benefits of solving it, as in this case – the return of a species that has disappeared from nature, are important for the final result of any activity. In this sense, PR, although at first sight not directly committed to reintroduction methods, has enormous importance for the ultimate success of the work.

The methods related to PR in the Green Balkans activities for the return of the Lesser kestrel, in general, can be divided into the following groups:

- Promotion – this includes participation in various festivals and events, writing news, participation in conferences, website, profiles in various social networks, various contests.
- Educational initiatives – conducting presentations to children, representatives of local communities – hunters, farmers, livestock breeders and the local authority, organizing volunteer initiatives.
- Information materials and models – printed materials, exhibitions and models, T-shirts and other printed textile materials.
- PR infrastructure – visitor and information centres, with specialized exhibitions included.
- Work with the media – media appearances, training, organization of events for journalists.
- Work with institutions – seminars, training, meetings, conferences.

Diet methodology for captive breeding and reintroduction of Lesser Kestrels (*Falco naumanni*) in Bulgaria

Rusko Petrov^{1,2}, Yordanka Vasileva¹, Daniel Gadzhakov², Stilyana Yaneva^{1,3}, Ivaylo Klisurov¹

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²Trakia University, Bulgaria

³Agricultural University of Plovdiv, Bulgaria

Keywords: biodiversity, birds of prey, conservation, raptors, wildlife, WRBC

In Bulgaria, a reintroduction programme is underway, thanks to which the species is again breeding in the wild in the country, and the local population is increasing. Diets play a particularly important role in breed and release programmes, as they affect the health of breeding pairs, and of their offspring. With the ultimate goal for the captive-bred birds being to re-establish viable lesser kestrel populations, releasing healthy falcons is paramount. As part

of the ongoing Lesser Kestrel reintroduction efforts in Bulgaria, well-rounded diets were carefully tailored to the species' requirements, and adequate accompanying sanitation procedures were ensured in the captive-breeding facility. Outlined are best practices concerning the variety of dietary regimes for lesser kestrel in captivity and for released kestrels based on the species biology and behaviour. The meals were different for non-breeding birds, breeding birds, chicks in the breeding facility, chicks from a wild colony, and for released wild chicks. When providing food, the season was considered too, and the quantity of food portions and the number of feedings per day were adjusted. The different techniques aimed at replicating wild conditions resulted in a natural breeding behaviour for the Lesser Kestrel kept in captivity, and natural adaptation for the released juveniles. The meal preparation methods kept the risk of food-transmitted diseases to a minimum. Implementing a specific and consistent diet methodology for the past 10 years, has helped create a strong breeding group and healthy released Lesser Kestrels.

The Nature and Cultural-Historical Heritage in the Municipality of Svilengrad

Stefan Dimitrov¹

¹Historical museum – Svilengrad, Bulgaria

Nature and cultural-historical heritage are in a constant relationship in now days. During the various historical ages, the environment has always had an impact on the development of settlements in certain ecological zones, characteristic of the Bulgarian area. In the present study, we will present the immovable cultural heritage in Svilengrad and the region and the typical for this area, representatives of the various ecological zones.

Method of historical reconstruction and analysis of historiographical data.

After looking in detail at the biodiversity that extends over the territory of the Municipality of Svilengrad, we can conclude that there is the availability of a rich and strong ecosystem, which predisposes the cultivation of various crops and animals in our region, which helps the people inhabiting this area to deal with most diverse and rich labor activity.

All this biodiversity combined with the well-preserved cultural monuments are a great prerequisite for the development of various types of tourism in this area.

I express my gratitude to the organizers of the conference for the opportunity provided to introduce the audience to the cultural-historical heritage and biodiversity in Svilengrad and the region.

Prophylaxis and veterinary cases in captive breeding for the reintroduction of Lesser Kestrels (*Falco naumanni*) in Bulgaria

Stefka Dimitrova¹, Rusko Petrov^{1, 2}, Daniel Gadzhakov², Ivaylo Klisurov¹

¹ Green Balkans – Stara Zagora NGO

² Trakia University, Bulgaria

Keywords: beak, chicken neck, deworming, perches pododermatitis, talons

For 10 years, every year, all lesser kestrels from the breeding group at the Wildlife Rehabilitation and Breeding Centre (WRBC), part of Green Balkans – Stara Zagora NGO, underwent a prophylactic examination twice a year. The examinations were scheduled January – February and October – November, depending on weather forecasts. The examination included a comprehensive overview of the birds' condition. Depending on the method of rearing, feeding and the perches in the aviary, overgrown beaks and talons were coped. Good practice includes all stable perches in the aviaries to be lined with artificial grass, and the rope ones to be with a rope diameter of 24 mm. Food with bones, like chicken neck, should be present in the falcons' menu so that they can file their beaks, otherwise the kestrels can end up with crooked or broken beaks, and pododermatitis. The floors of the aviaries were cleaned daily to prevent infectious and bacteriological diseases. Interesting veterinary cases include shot lesser kestrels, electrocuted individuals, birds falling into machine oil, fights between females for a nest box, necrotizing legs from torn artificial grass, birds beaten and killed by their direct competitor – the Little Owl (*Athene noctua*), Lesser Kestrels killed by Northern Goshawk (*Accipiter gentilis*), poisoned birds from consuming insects treated with pesticides, and problems in the first days after hatching.

Different types of nest boxes used by Lesser Kestrel (*Falco naumanni*) after being recovered as a breeder in Bulgaria

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²Green Balkans – Stara Zagora NGO, Bulgaria

Keywords: Falcon, raptors, endangered species, Sakar SPA.

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Lesser Kestrel often nests in urban areas surrounded by agricultural areas. This makes the species largely dependent on human activity to availability of nesting places. The loss of natural nesting sites was one of the main reasons the species to become extinct in the late 20th century in Bulgaria. After it was recovered as a breeding species in country, one of the main goals of the expert is to make the colony stable. For implementation of these goals, it is necessary to provide a suitable nesting place for the species. Field studies show that the provision of artificial nest boxes for Lesser Kestrel resulted in increasing of numbers and strengthening existing colonies. There are different types of artificial nest boxes like: Classic wall, cavity wall, under-roof and etc. Conducting daily observations of the birds, the colony's nesting territory was determined – concentrated around the Lesser Kestrel Release and Adaptation Module. In the past years large proportion of the Lesser Kestrel population in Bulgaria nested in artificial nest boxes thus proving that species easily occupies artificial nests designed for it.

Captive-bred and released Lesser Kestrels (*Falco naumanni*) for reintroduction in Bulgaria between 2009 – 2022

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Keywords: captive breeding, Lesser Kestrel, Levka, Stara Zagora, WRBC

In 2009, a captive breeding programme for the critically endangered in Bulgaria Lesser Kestrel (Red Data Book of the Republic of Bulgaria, 2011) was initiated in the Wildlife Rehabilitation and Breeding Centre (WRBC), part of Green Balkans – Stara Zagora NGO, with two pairs imported from Germany. Thanks to the following EU finding, 40 genetically diverse birds were transported from Spain to the WRBC, as part of the five-year project Lesser Kestrel Recovery LIFE11 NAT/BG/000360. The breeding group was maintained after the end of the project, and a new one – project LIFE for Lesser Kestrel LIFE19 NAT/BG/001017, was started in 2020. Following the breed and release results reported by Marin & Vasileva (2016), this study summarises the whole period of the lesser kestrel reintroduction activities, from 2009 until 2022. As a result of implemented captive breeding methods, between 2009-2022, there were between 2 and 25 lesser kestrel breeding pairs every season in the Centre. There was breeding evidence in 9 out of these 13 breeding seasons. The total number of chicks hatched over the years from the breeding group at the WRBC is 405, and the total number of released lesser kestrels hatched there is 362. Dozens of chicks rescued over the years from wild colonies were raised by the pairs at the WRBC, acting as foster parents. For the purposes of the project, birds from the WRBC breeding program were released in Levka and in Stara Zagora (from the WRBC). Good partnership was established with zoos and breeding centres in Bulgaria, Spain, the UK and Czech Republic, as throughout the years birds and knowledge was exchanged between the facilities.

Marin S, Vasileva Y 2016: Bulgarian Lesser Kestrel captive breeding stock at the Green Balkans WBRC. In: Abstract book from International Lesser Expert Workshop, Plovdiv, Bulgaria, 4-8 October 2016: – 7. Available at: <https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjy8efXuP5AhXIQvEDHXDOBIMQFnoECBMQAQ&url=https%3A%2F%2Fgreenbalkans.org%2Fbirdsofprey%2Flesserkestrellife%2Fdocument-86953&usg=AOvVaw3X0IP9wRvkY869R2fblMJ7>

Red Data Book of the Republic of Bulgaria 2011: Vol. 2. Animals. Available at: <http://e-ecodb.bas.bg/rdb/en/vol2/>

Windfarm collisions on Lesser Kestrel: even increasing populations can suffer strong demographic impacts

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The impact of bird mortality by collision on windfarms has often been evaluated at the individual level, but rarely at the population level. The Lesser Kestrel *Falco naumanni* is an endangered migratory short-lived raptor, susceptible to collision with wind turbines. We evaluated the impacts of windfarm turbine collisions on demography of the largest Lesser Kestrel population in France. Using data from local monitoring of reproduction and windfarm mortality surveys, combined with capture-recapture ringing data at a nearby population, we quantified vital parameters of fecundity and survival, in order to parameterize a matrix population model to study the viability of this population. The breeding success was high and varied in synchrony with survival probabilities. Between 2013 and 2020, 43 carcasses were found below wind turbines, and when accounting for detection and persistence rates, the true mortality should approach 154 individuals in that period, i.e. 3% of the studied population was affected by collision each year. The matrix model showed that the population growth observed was only possible if there was a constant recruitment of 26 immigrant individuals each year in the population. Without overmortality by windfarm, we predict that this population would have 22% more breeding pairs than that observed in 2020. Simulations over 30 years showed that, under current immigration rate, the population should decline if overmortality exceeds 11%. If immigration ceases, the population would decline above 5% overmortality per year. It is urgent to monitor and reduce overmortality by collision on windfarms that threatens this lesser kestrel population. More generally we advocate the use of PVA demographic models into impact assessment studies to avoid placing new windfarms close to rare species that could not sustain additional mortality by collisions.

The new Lesser Kestrel actions plan in France (2021-2030)

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Article citation:

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The lesser kestrel which belongs to endangered species has been categorized as "Vulnerable" by the Red List at the national level (French Committee of the UICN & MNHN, 2008) given the low numbers and the low fragmentation of the French population. After nearly disappearing from our country at the beginning of the eighties, the breeding population is recovering gradually. The size of the population is 626 pairs in 2021, nesting within 4 areas of the regions Provence-Alpes-Côte d'Azur and Occitanie.

The main threats are degradation of feeding habitat around the existing colonies, (densification of vegetation, land-use change, collapse of sheep farming...), anthropogenic mortality causes (especially wind farms), the low number of cavities suitable for nesting for specific populations such as that of Crau, as well as the degradation of the wintering conditions (drought period in Sahel, pesticide use...).

The overall aim of the national plan is to achieve a number of more than 1000 breeding pairs spread across 30% of the reference area; these subpopulations must also present reproductive parameters which may enable them to resist the possible degradation of wintering conditions.

To help the preservation and the long-term development of the lesser kestrel in France, it is imperative to act jointly

(e.g. promoting collaboration among Mediterranean stakeholders) for populations monitoring, protection and public awareness. The 16 identified actions, therefore, focus on these three topics and are grouped under five specific objectives which are (apart from the global coordination) :

- Promote the public consideration of the action plan.
- Follow the evolution of populations.
- Promote the development of populations.
- Reduce the risk of human-induced mortalities.
- Inform and raise public awareness.

The main conservation actions are to implement management measures to fight against the degradation of feeding and nesting habitats in the breeding area, to reduce the risks of anthropogenic mortality, to promote connection with other European populations and to support the conservation of the species in its wintering areas.

GREECE

Evaluation of the Lesser Kestrel population and habitat in Kilgis area, Northern Greece

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Keywords: habitat evaluation, Lesser Kestrel, Northern Greece, SPA

Sites of Northern Greece which have been included in the "LIFE19 NAT/BG/001017 – Better Life for Lesser Kestrel in South-East Balkans" project are: (1) SPA Periochi Anthofytou (GR1230006), (2) SPA Limni Pikrolimni – Xilokeratea (GR1230004) (3) SPA Koilada Erythrotamou: Asvestades, Koufovouno, Vrysika (GR1110011). The SPA Periochi Anthofytou (GR1230006) hosts a colony of Lesser kestrel (*Falco naumanni*), estimated at 25 breeding pairs, the largest colony in the Prefecture of Kilgis. Smaller colonies can be found in nearby villages (Pikrolimni, Mikrokampos, Kokartza, and N. Sirakion). The presence of Lesser Kestrels in SPA Koilada Erythrotamou is now in doubt. A site evaluation field protocol describing and evaluating the Lesser Kestrel habitat was developed as part of the project. The habitat evaluation of the project sites for lesser kestrels was carried out based on the identification of different habitat types in a GIS environment using the Corine land use system and running a simplified model to identify the most suitable foraging areas in each SPA. Finally, a habitat availability map was created for each SPA. We concluded that 84.8% of the SPA Periochi Anthofytou is suitable for lesser kestrel foraging, whereas this portion was 70% and 60.5% for SPA Limni Pikrolimni – Xilokeratea and SPA Koilada Erythrotamou respectively. In addition to the usual threats to the Lesser Kestrel populations and habitats, a recent one was identified, that of photovoltaic stations/parks, especially for the SPA Periochi Anthofytou. People's attitudes to the Lesser Kestrel biology and ecology parameters in relation to farming activities were surveyed through filling questionnaires in the project areas as a preliminary information for the development of a Good Practice Guide for Farmers. Other ongoing project activities in N. Greece include the selection of a site for the construction of a release facility and the appropriate releasing method.

A GIS- Mapping approach for assessing habitat suitability for Lesser Kestrel (*Falco naumanni*) in North Greece

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Keywords: habitat suitability indices model, nest boxes provision, North Greece, species colonization

In the past, the Lesser Kestrel was widely spread in North Greece and Bulgaria, but over the years the species has declined due to habitat degradation, mainly because of agricultural intensification, the use of pesticides and the associated land use changes. At present, the species is found in only 21 colonies in North Greece and only two in Bulgaria. The enhancement of existing Lesser Kestrel colonies and the establishment of new ones in North-eastern Greece will fortify the connection among subpopulations in Southeast Balkans and strengthen, stabilize and increase the newly established Lesser Kestrel colonies in Bulgaria. A habitat suitability indices cartographic model was devel-

oped to identify suitable foraging and nesting areas in central and eastern North Greece. Three different indices were created, the foraging habitat suitability index (FHSI), the nesting habitat index (NHI), and the abiotic conditions index (ACI). Those three indices were combined later to create the combined suitability index (CSI) for each settlement in the area of interest (677 of totally 1280 settlements in North-Eastern Greece). Five environmental parameters were selected as predictors of the FHSI (altitude, difference of NDVI between spring and summer, water and wetness index, tree density cover, and land cover use), three parameters as predictors of the NHI (human population status in 2011, the population trend for the period 1991 – 2011, and the build-up area of each settlement), three climatic and a soil parameters as predictors of ACI (mean precipitation in March-April, max precipitation in June, min temperature in April, and the soil bulk density). At the stage of the combined suitability index, we were able to create a matrix of CSI values for all the settlements and evaluate their importance as foraging (within a buffer area of 4,5 km from the settlement) and nesting habitat for Lesser Kestrel. Furthermore, all the distances of each settlement from the known colonies were calculated to estimate the proximity of each settlement to existing colonies and the possibilities of colonization through dispersal movements from the known colonies. Within this framework, it was possible to identify the most important settlements for further conservation measures needed to be implemented or identify the future threats or pressures for the Lesser Kestrel in the study area. Conservation measures like the placement of artificial nests, should be designed and implemented in the most suitable settlements with high possibilities of colonization and the most valuable foraging areas for the Lesser Kestrel.

ITALY

Potential threats posed by the wind power industry on the Lesser Kestrel: a continental-scale assessment

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Thirty-five per cent of EU production of electricity derives from renewable sources. Wind power energy covered 16% of EU electricity demand in 2020, with a strong positive trend. To reach net-zero greenhouse gas emissions by 2050, unprecedented transitions in all aspects of society, including energy production, are required. Wind power energy is seen as a possible solution to reach this ambitious goal.

Wind power plants, although potentially helping to reach the EU sustainability goals in terms of green energy, pose serious threats to biodiversity conservation, determining habitat loss and direct impacts on wildlife, including bird mortality. There is some evidence of direct mortality determined by wind power plants on the lesser kestrel, but a clear assessment of the impacts posed by the wind power industry on the species lacks. In this study, we aimed at assessing the threats posed by the wind power industry to the three largest European populations of LK (Iberian, Italian, and Greek) and we evaluated the potential mitigation role of Natura 2000 network.

By profiting from a global dataset on wind power plant distribution, we explored the spatial intermixing of 1,837 colonies with power plants. This collaborative study was possible thanks to the building of an international network of lesser kestrel experts promoted by the LIFE FALKON project.

The median nearest-neighbour turbine-colony distance resulted lower in the Italian population (12.8 km), followed by the Iberian (27.5 km) and Greek (46.2 km). The same applied to the number of turbines within a radius of 10 km from colonies. Only two per cent of Greek colonies have at least one turbine within 10 km, compared to the 19% of the Iberians, and the 67% of the Italians. Comparably, 2.5% of the Greek population (number of pairs), 18% of the Iberian, and 68% of the Italian have at least one turbine within 10 km. When considering whether a colony is within or outside Natura 2000 network, most metrics did not differ, suggesting that this legal regulation is likely not sufficient in preventing the building of wind power plants in the vicinity of lesser kestrel colonies.

We are now developing our framework to explore the impact of wind power plants on the lesser kestrel at an individual level. To do so, we collected and managed data for 327 individual-tracked lesser kestrels from all three populations, aiming at exploring the potential exposure of lesser kestrels to wind plant mortality. During the meeting, preliminary results on this will also be presented.

The LIFE FALKON project: Fostering the breeding range expansion of central-eastern Mediterranean Lesser Kestrel populations

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The Lesser Kestrel suffered a dramatic population decline during the last century, due to changes in farming practices and climate change. The species is currently experiencing a range contraction in the Southern breeding range **while it is expanding towards the North-East**, a process that will last in the future. This expansion will take place in the Central-Eastern Mediterranean region and will be triggered by those populations located at the North-Eastern margins of its distribution range. However, the persistence of these small and isolated populations is currently negatively affected by both intrinsic (e.g. small population size) and extrinsic (e.g. destruction of nest sites) threats.

The interventions of LIFE FALKON (LIFE17 NAT/IT/000586, www.lifefalcon.eu) target the populations settled at the northern edge of the current distribution range of the Lesser Kestrel, having as a general objective to foster the resilience of the species to climate change by improving the conservation status of northern Italian and northern Greek populations. The project started in July 2018 and it will end in December 2023, has a total budget of 1,8 M euros and it is structured in 17 main Actions which take place over four project areas: Po Plain (northern Italy), the city of Ioannina (NW Greece), the villages around Komotini (NE Greece) and the island of Limnos (NE Egean sea, Greece). The project is coordinated by the National Research Council of Italy (Coordinator) and the partnership is composed by the University of Milan, the Institute of Environmental Research and Protection of Italy (ISPRA), the Hellenic Ornithological Society and ALDA – European Association for Local Democracy. In its starting phases, LIFE FALKON studied the population status, the genetic, the movement ecology (>70 GPS tracked birds) and the habitat requirements of lesser kestrels in the project areas. As practical actions, **LIFE FALKON provided over 400 nest boxes in the project areas and built up five nesting towers in northern Italy**, whose colonization have been fostered through the translocation of chicks from southern populations. Moreover, LIFE FALKON created a **Lesser Kestrel comic and a floor game**. These promotional products have been already enjoyed by over 2,000 school pupils in the two countries. A documentary on the project activities will be released in early 2023. Stakeholders, farmers, nature lovers and local citizens are being involved in presentations, roundtables and field visits in order to raise awareness over lesser kestrel and farmland biodiversity protection. LIFE FALKON actively working on consolidating the international network of lesser kestrel experts and **will host a closing conference of its activity in form of an international congress in autumn 2023**. Since the beginning of the project, the target population are already experiencing a mild recovery, stating the efficacy of the LIFE FALKON interventions.

SERBIA

Observations of Lesser Kestrel (*Falco naumanni*) in Serbia in the 21st century

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Keywords: 21. Century, Lesser Kestrel, migratory, Serbia

During the most of 20th century, the Lesser Kestrel was widely distributed in Serbia, primarily in the South of the country, where it inhabited lowlands and hilly areas. During the second half of the 20th century in Serbia, there was a sharp decline of the breeding population of this species. From the beginning of the 21st century until today, it is considered an irregular or extinct as a breeding species in Serbia.

In the last 5 years, the Lesser Kestrel has been observed more and more frequently in Serbia, the largest number of sightings is still on migration, some findings show the presence of this species during the breeding season, but we still do not have any indications of nesting in Serbia. This paper presents data collected by authors and also data collected by Bird Protection and Study Society of Serbia (BPSSS) field ornithologists and BPSSS members and volunteers. Lesser kestrel is a species that is difficult to identify in field, so only photo-documented data was used in this paper. We can say that this species has become a regular migratory species and it is a question of the moment when the first nesting pair after many decades will be confirmed in Serbia.

SPAIN

Prototype building to naturally breed a colony of *Falco naumanni* applying new releasing techniques

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The structure lacks a roof. The construction exclusively presents four bare walls with measures of 5x5 m or 5x10 m. By not contemplating a roof, the interaction with *Columba libia*, *Corvus monedula* or *Pyrrhocorax pyrrhocorax* is eliminated.

It offers anti-predation measures against aerial predators, such as *Milvus milvus*, *Milvus migrans*, *Hieraaetus pennatus* or *Accipiter gentilis*; as well as measures against terrestrial predators as *Martes foina*, *Rattus norvegicus*, *Genetta genetta* and *Felis catus*. The antipredation systems give this original design safety and reliability.

The elements that make it up: shelves, perches, releasing module and nests, being located inside four very high walls and without a roof, are not visible. From the outside you can only see four smooth, bare walls without any element on the surface: no holes, no perches, no ledges.

In this future colony, the physical isolation for the *Falco naumanni* is maximum, they do not perceive the outside area until they are able to fly. Acoustic insulation is relevant, because when looking at such high walls, in a hermetically sealed enclosure, outside noise goes unnoticed; It thus becomes an isolated and safe place but, above all, invisible to people, which will avoid 100% the inconvenience of any human activity.

The nests are installed outdoor on the inner facades of the walls. They are designed and manufactured by DEMA, have an internal anti-predation system, are anti-vibration, water-repellent, fire-retardant, temperature-adjustable with aerodynamic ventilation and are handcrafted using natural materials (cork and lime mortar). Each nest has an anchoring structure integrated into the walls and base and also has a wide shelf to prevent chicks from falling down.

The durability of the material is similar to one of a human dwelling and is guaranteed by construction experts of ecological houses. It is weathering resistant, withstand temperatures from -20°C to +50°C without altering their structure in the slightest. The interior temperature of the nest, located in full sun all day, is the same as that obtained in the same environmental space with a north orientation and continuous shade. The number of chicks flown from these nests is, in percentage terms, much higher than those flown from other types of nests made of wood or cement.

Exclusive characteristic of the *primillar*-building, is the prevention of falls of chicks from the nests. If one of them falls down, it will fall in a closed area where it cannot be captured by any terrestrial or aerial predator and will be able to access the nests located on the walls again, even if they cannot fly, by climbing to the upper area through a simple access system.

This original building marks a substantial difference when comparing it with traditional breeding buildings in which chicks falling to the ground is something inevitable and the vast majority die predated. In the three projects currently developed by DEMA in Spain with this prototype, it was found that 100% of the released chickens flew successfully.

Lesser Kestrel in Turkey

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The Lesser Kestrel (*Falco naumanni*, Fleischer, 1818) is a small falcon species whose numbers have been declining rapidly since the second half of the 20th century, mainly due to habitat destruction and activity of intensive farming. Although there has not been comprehensive research on the species in Turkey before, the presence of the species has been confirmed in observer records in various activity reports conducted by the Ministry of Agriculture and Forestry, and wind power plant study reports. With the data obtained from these studies, it was seen in 52 of our 81 provinces. In addition, the provinces where the species is concentrated are İzmir, Balıkesir, Eskişehir, Ankara and Konya. The population in Turkey is estimated to be between 5,000-7,000 pairs. In our country, the species loses its nutrients and lives due to the increase the migrations from the village to the city, because the demolition or modernization of the old village houses, which the species prefer as a breeding place and increasing use of pesticides in agricultural areas cause these reasons. In our country, it is necessary to start studies to protect and increase the population of this species by raising its awareness and priority.

In our country, studies on the small kestrel are insufficient until today. For this reason, it should be ensured that with Domestic and International projects the species is better known in our country and continues its role in the ecosystem.