LIFE FALKON
LIFE on the move

DELIVERABLES

ACTION F.2

LIFE FALKON AFTER LIFE PLAN

DECEMBER 2023

LIFE17 NAT/IT/000586 *www.lifefalkon.eu*

Partner responsible for the action:

CNR-IRSA Consiglio Nazionale delle Ricerche – Istituto di Ricerca sulle Acque

Partnership:

Consiglio Nazionale delle Ricerche
UNIVERSITÀ DEGLI STUDI DI MILANO
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About the project :
The activities described in this report were carried out under the framework of action E5 of the LIFE project "LIFE FALKON" (LIFE17 NAT/IT/000586, www.lifefalkon.eu), further referred to as either "the LIFE project" or "LIFE FALKON", funded by the European Commission, co-funded by the Green Fund and Fondazione Cariplo and implemented by the CNR-IRSA, the Istituto Superiore per la Protezione e la Ricerca Ambientale (ISPRA), the Sistema Nazionale per la Protezione dell'Ambiente (SNPA), the University of Milano, the Hellenic Ornithological Society (BirdLife Greece) and the European Association for Local Democracy (ALDA).

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Project acronym: LIFE FALKON

Project full title: Fostering the breeding rAnge expansion of central-eastern Mediterranean Lesser-Kestrel pOpulatioNs

Project start date:	1 July 2018	
Project end date:	31 December 2023	
Project duration:	66 months	
Total budget:	1,724,303.96 €	
EC contribution:	1,103,064.00 €	(64% of the total eligible costs)
Coordinating Beneficiary:	CNR-IRSA National Research Council of Italy - Water Research Institute	
Associated Beneficiaries:	University of Milan	
	ISPRA - Istituto Superiore Protezione e Ricerca Ambientale	
	HOS/Birdlife Hellenic Ornithological Society	
	ALDA - Association for Local Democracy	
Project Website:	www.lifefalkon.eu	

Abstract

After-LIFE period: 5 years. 1 Jan 2024 to 31 Dec 2028

1-Introduction

The present report consists of an After-LIFE Conservation Plan for the LIFE Nature project LIFE FALKON (LIFE17 NAT/IT/000586), whose full title is 'Fostering the breeding rAnge expansion of central-eastern Mediterranean Lesser-Kestrel pOpulatioNs'.
The project was implemented between 2018 and 2023 by a consortium of five beneficiaries (see 'Project Factsheet'). The original end date of the project was settled at the end of 2022, but due to the COVID-19 pandemic, most of the concrete actions of the project had to be delayed by one breeding season (one year). Therefore, the Beneficiaries requested a corresponding extension of the overall project duration.

Despite several LIFE projects having the lesser kestrel among or as the only target species since the beginning of the LIFE programme in 1992 (see Table 1), LIFE FALKON was the first to propose interventions focused on the northern, isolated populations of this species, possibly with the exception of 'Lesser Kestrel Recovery' (LIFE11 NAT/BG/000360) which aimed to reintroduce lesser kestrel in area where the species went recently extinct.

The purpose of LIFE FALKON was, however, different. The researchers and conservationists that later became the LIFE FALKON team, noticed at that time (2015-2016) that lesser kestrel was expanding northward and that the climatic forecasts for the core breeding areas highlighted that the species would face unprecedented challenges for its long-term persistence (Morganti et al. 2017). We thus started collecting data on the abundance and conservation status of those tiny populations that represented the forefront of the northward expansion of the species, currently minorities in terms of absolute population size but, in a near future, potentially crucial to support the survival of the species to climate (and global) change. We quickly realized that from Italy to Greece, these small populations were facing analogous problems: compared to the main breeding areas, where the species is well-known among the public and protected by SPAs and other regulations, these small recently established populations were virtually unknown to both local citizens, authorities and (often) local environmentalists. Moreover, they were losing suitable nest sites at an impressive rate, in northern Italy because of the rapid collapse and demolition of

the abandoned rural buildings they used for breeding due to the dramatic 2012 Emilia-Romagna earthquake (https://it.wikipedia.org/wiki/Terremoto_dell%27Emilia_del_2012).

So far, the keyword CLIMATIC RESILIENCE represents the central goal of LIFE FALKON, eventually structured in a series of concrete objectives.

Table 1. List of LIFE projects that had the lesser kestrel among the target species since the creation of the LIFE program (1992). For the project in bold, the Lesser kestrel was the ONLY target species.

Order	Reference	Acronym	Year	Lead Partner Country
1	LIFE93 NAT/F/010400	Crau sèche - 2nd phase (Volet A)	1993	France
2	LIFE93 NAT/F/010401	Crau sèche - 2nd phase (Volet B)	1993	France
3	LIFE95 NAT/P/000137	Conservation 'Vale do Guadiana'	1995	Portugal
4	LIFE95 NAT/F/001215	Crau Sèche - 2nd phase (Part B)	1995	France
5	LIFE95 NAT/P/000178	Steppe Birds in Castro Verde	1995	Portugal
6	**LIFE97 NAT/F/004119**	**Faucon Crecerèlette**	**1997**	**France**
7	LIFE98 NAT/IT/005136	Beigua Grassland	1998	Italia
8	**LIFE99 NAT/E/006341**	**Falco naumanni/Villafafila**	**1999**	**España**
9	LIFE00 NAT/RO/007171	Iron Gates	2000	Romania
10	LIFE00 NAT/E/007348	ZEPA La Serena	2000	España
11	**LIFE00 NAT/E/007297**	**Falco Aragón**	**2000**	**España**
12	**LIFE02 NAT/P/008481**	**Peneireiro**	**2002**	**Portugal**
13	LIFE04 NAT/ES/000034	ZEPA eléct. Aragón	2004	España
14	**LIFE05 NAT/F/000134**	**LIFE TRANSFERT**	**2005**	**France**
15	LIFE05 NAT/IT/000009	RAPACI LUCANI	2005	Italia
16	LIFE05 NAT/IT/000026	Fortore 2005	2005	Italia
17	LIFE06 NAT/IT/000026	Rapaci del Gargano	2006	Italia
18	LIFE07 NAT/P/000654	Esteprias	2007	Portugal
19	LIFE07 NAT/IT/000499	Pianura parmense	2007	Italia
20	LIFE08 NAT/E/000068	ZEPA ESTEPARIAS ANDALUCIA	2008	España
21	LIFE09 NAT/IT/000150	ZONE UMIDE SIPONTINE	2009	Italia
22	**LIFE11 NAT/IT/000068**	**Un Falco per Amico**	**2011**	**Italia**
23	**LIFE11 NAT/GR/001011**	**Lesser Kestrel Thessaly**	**2011**	**Ellas**
24	LIFE11 NAT/IT/000175	LIFE AUFIDUS	2011	Italia
25	**LIFE11 NAT/BG/000360**	**Lesser Kestrel Recovery**	**2011**	**Bulgaria**
26	**LIFE15 NAT/ES/001016**	**LIFE- ZEPAURBAN**	**2015**	**España**
27	LIFE15 NAT/ES/000734	LIFE STEPPE FARMING	2015	España
28	LIFE16 ESC/IT/000002	CHOO-NA	2016	Italia
29	**LIFE17 NAT/IT/000586**	**LIFE FALKON**	**2017**	**Italia**
30	**LIFE19 NAT/BG/001017**	**LIFE for Lesser Kestrel**	**2019**	**Bulgaria**
31	LIFE20 NAT/FR/000080	LIFE SOS Crau Grasshopper	2020	France
32	LIFE20 NAT/ES/001172	LIFE FARMINGBARDENAS	2020	España
33	LIFE20 NAT/ES/000035	LIFE EL HITO	2020	España

2. Main objectives of LIFE FALKON

1) Obtain an accurate assessment of the conservation status of those populations which are considered crucial for the northward breeding expansion of the lesser kestrel in central-eastern Europe.

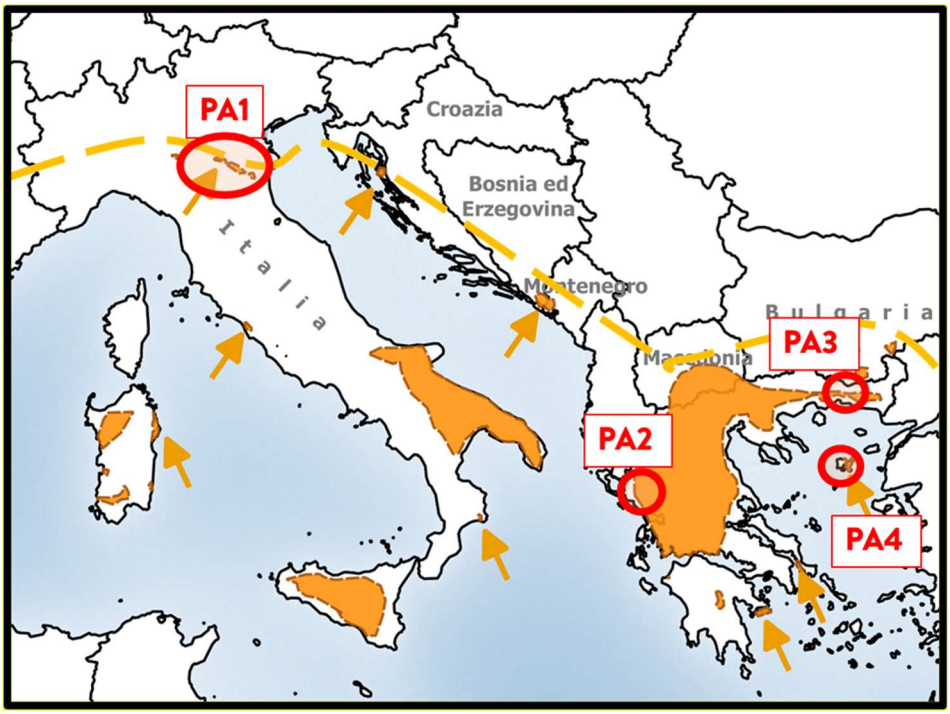
2) Foster the resilience of the central-eastern European population to climate change, improving the conservation status of Italian and Greek populations breeding at the north-eastern margin of the breeding distribution range.

3) Improve foraging and nesting habitat quality in intensive farmland areas and SPAs where the species breed in the project areas.

4) Establish a collaborative international network to a) support the implementation of conservation actions, population monitoring programs and knowledge sharing across the central-eastern Mediterranean region; b) foster replicability and transferability of project actions in south-eastern Europe.

5) Promote public awareness concerning the lesser kestrel and biodiversity conservation in the northeastern margins of the breeding range, emphasising environmental education.

Figure 1. Geographical distribution of the Project Areas (PA) of LIFE FALKON



3. Project Areas of LIFE FALKON

The above-mentioned objectives were implemented in Italy and Greece, over four different Project Areas (Figure 1).

PA1. South-eastern Po Plain - Project area 1 - Northern Italy

A vast, super-intensive agricultural plain, hosting about 70 pairs of lesser kestrels in 2016, growing to 130 in 2023. The main threat here is the loss of breeding sites, represented by isolated rural buildings, mostly decaying or that are demolished or refurbished.

PA2. Wider area of the municipality of Ioannina - Project area 2 - North Western Greece

The city of Ioannina hosts a small local population of lesser kestrels that breed in the city centre and are threatened by the renovation of roofs and buildings. Also, during the autumn approximately three thousand lesser kestrels concentrate every year in Ioannina city centre where they form big pre-migration roosts on trees.

PA3. Wider area of the municipality of Komotini - Project area 3 - North Eastern Greece

Several small villages south of Komotini host small and scattered populations of lesser kestrels, which find nesting sites on suitable buildings. As for other PAs, the availability of nesting sites is decreasing, threatening the long-term persistence of the population.

PA4. Island of Lemnos - Project area 4 - North Eastern Aegean Sea, Greece

One of the biggest islands of the Egean, Lemnos is mostly agricultural and hosts a population of lesser kestrels scattered in several villages. The developing economy of the island accelerates the refurbishment of buildings and nest cavities for kestrels are rapidly decreasing.

2-Technical summary and main achievements

The activities of LIFE FALKON were structured over five groups of actions, each with its peculiarities and achievements, here briefly resumed. More detailed info on the activities realized in each group of actions is available at this link: http://www.lifefalkon.eu/en/deliverables/

Actions A - Preparatory and study actions needed for the project to be effective and reach its goals

With these actions, we collected accurate information on the conservation status of the species in all the Project Areas (PAs) every year between 2018 and 2023. We designed different models of nestboxes and tested several prototypes in order to come up with the ones suited for a wide range of installation options. We also designed two versions of a nesting tower, a building specifically designed for lesser kestrel safe breeding at localities where nesting availability is low . At the same time, we identified suitable places for the installation of nest boxes and the construction of nesting towers, obtaining all of the due permits. Eventually, we realized a wide genetic and behavioural (through the deployment of over 60 GPS dataloggers on breeding birds from different PAs) study to assess the relationships among the European populations of lesser kestrels and identify the proper source population for the hacking activities planned for PA1 (Po Plain, Italy).

Actions C - Practical conservation measures

These actions represent the core activities of the project. In total, the LIFE FALKON project installed over 400 nestboxes over the project areas. The greatest percentage of them were installed on buildings, some on electric poles (insulated in order to avoid the possibility of electrocution- related mortality for the species) and in some occasions nestbox complexes in the form of 'walls' were constructed on safe structures (e.g. water towers). We also constructed five nesting towers in Italy (PA1), one of which was specifically created for covering the needs of the 'translocation' action. In the framework of this action, we translocated 30 lesser kestrel chicks per year for three consecutive years from Matera (southern Italy) to Po Plain (PA1), and released them into the special-suited nesting tower, built near Bologna. These chicks imprint the tower as their natal site, also due to the presence of two adults (permanently injured individuals from a rescue centre) hosted in a special cage sited within the structure. The aim was to accelerate the occupation rate of the breeding towers by increasing the familiarisation of the individuals with these safe structures. These chicks coming from a genetically and behaviourally compatible population, yet one used to breed into buildings and nestboxes, will foster the adaptation of the species in PA1 by selecting to use the breeding towers in order to breed.

Actions D - Population surveys, monitoring of practical actions success and assessment of project impacts among local communities and stakeholders

In these actions, we carried on the systematic monitoring of both wild populations and the ones taking advantage of the nesting structures installed with C actions in order to breed. In addition, we evaluated the occupancy rate of the artificial nesting sites provided which overall, was found to be low (as expected, around 10-15%) but increasing over the years. Nestboxes installed in the proximity of buildings and colonies that were demolished or refurbished were all occupied, showing that our intervention was timely to save the local population in these cases. Nesting towers were poorly used by lesser kestrels with a few exceptions, but their utility as supplying long-term granting of safe nesting sites should be evaluated over a longer time-span.

In the framework of D2 action, we deployed 30 GPS devices on first-year birds in PA1, either locally born or translocated from Matera (see C actions), and we found that all these birds had the same post-fledging and migration behaviour as local wild birds, confirming the right selection of source population.

Furthermore, through the diffusion of hundreds of questionnaires among citizens and stakeholders, we assessed the efficacy of the project's communication and dissemination actions, especially regarding informing them on the need for protection of farmland biodiversity and the lesser kestrel. We also studied the diet and the foraging habitat selection of lesser kestrels, shedding light on which agro-environmental measures may contribute to the support of its populations. These data, combined with additional ones deriving from dedicated field surveys, enabled us to quantify the role of lesser kestrel as a biological control agent against species perceived as pests by farmers. Eventually, through a further series of field censuses and observation protocol, we found that the lesser kestrel is an effective umbrella species for most farmland birds.

Actions E - Communication, Dissemination and Networking

With these actions, LIFE FALKON produced targeted informative material and campaigns, along with the organization of dedicated workshops for specific categories of stakeholders (i.e. architects and farmers). In parallel, the project largely aimed at the environmental education of pupils and teachers. For this reason, a set of education material was produced, including a comic and a floor game. In order to showcase and promote the produced material, environmental education experts from the project's partners in both Italy and Greece, realised educational activities in schools of the project areas, directly contacting more than 3,000 pupils, and also guiding hundreds of them in a field visit to the LIFE FALKON installations. In addition, the project's environmental education team also organized online seminars for teachers in order to train them on the use of the dedicated material and also facilitate the diffusion of it for use in schools beyond the Project Areas. We fostered the message of a possible coexistence between environmental

sustainability and biodiversity conservation by developing the 'lesser kestrel' beer, based on local wheat and artisanally brewed at a small-scale local brewery. Also, we produced the 15-min documentary, 'LIFE on the Move', which was translated into five languages and watched by thousands of people well beyond the Project Areas. Aiming to communicate the project's targets, as well as findings, to different target groups we also produced promotional material and target-specific brochures, which were diffused in the events that were realised. During all of the project we maintained an active communication flow with the general audience, through the project's social media accounts (Fb, Twitter, YouTube page).

We communicated our findings and also supported cooperation among the scientific community, through the publication of several papers and by contributing to national and international scientific congresses. Based on the aforementioned occasions, we built up a network of lesser-kestrel specialists who eventually met up during our Closing Conference (Lemnos Island, Oct 2023).

Finally, in 2022, our team joined a scientific expedition to Senegal, visiting the wintering quarters of European lesser kestrels in an effort to provide new insights into the needs and the behaviour of the species in its wintering sites.

All of our contacts were organized in a Community of Interest (CoI), through which the different groups were receiving targeted communications. All of our community was periodically informed on LIFE FALKON activities through a newsletter that we published in 9 (+ 1 special) editions.

Figure 2 Participants at the LIFE FALKON closing conference in Lemnos (Greece) 12-14 October 2023.

Actions F - Project management

We maintained constant and active communications among the Beneficiaries through periodical Steering Committees and uncountable bilateral meetings between the Coordinator and the Associated Beneficiaries. In the last months of the Project, we elaborated the After LIFE Plan, programming the activities for the next five years (2024-2028).

3- Evaluation of LIFE FALKON activities and after-LIFE targets: a SWOT approach

Effective planning of future actions and the continuation of project actions would strongly benefit from a proper analysis and identification of the strength and weakness factors experienced during the project period and which favoured/disfavoured the achievement of the project's goals. The commonest way to achieve this evaluation is the so-called SWOT approach (Strengths, Weaknesses, Opportunities and Threats).

	Positive Conditions	Negative Conditions
INTERNAL CONDITIONS	**Strengths**	**Weaknesses**
	- Establishment of a strong and well-connected community of researchers and lesser kestrel experts	- Some of the installed nestboxes (i.e. the 'pole model' of PA1) are showing external signs of degradation in the third year from the installation. The material chosen for the external overlay, turned out to be (partly) inadequate.
	- Establishment of a wide network of well-skilled and aware people, working at various levels and organized in a hierarchical way (local teams, national level, international level)	- The colonization rate of the nestboxes and nesting towers was, in some cases, below the expectations. However, the process may take some years, and this may turn into an 'Opportunity' soon.
	- The findings about habitat suitability and the proposed agro-environmental measures eventually became common know-how among the stakeholders of the Project Areas	- Fieldwork for monitoring and maintenance of nestboxes is costly, especially for remote areas such as PA4 (Lemnos). It is hence difficult to grant that these structures will be maintained beyond the After-LIFE, in the long-term, unless additional funding becomes available.
	- Municipalities and competent authorities are now conscious and aware of the problems that demolition and refurbishment pose for lesser kestrel and other birds	- Despite hiring and training of personnel by different Beneficiaries during the project, some did not complete their contract and abandoned earlier than project completion, in most cases in favour of longer-term contracts. This generated some turnover in personnel that somehow hindered the progress of the project.
	- A wide number of safe nesting structures is now available in the Project Areas, and binding agreements were signed, granting their persistence for at least 20 years. The local populations have, therefore, space to expand over this period.	
	- Populations within PAs have been expanding in recent years, in spite of the general negative trend of the species in the core breeding areas during the same period	

	Opportunities	Threats
EXTERNAL FACTORS	- Lesser kestrel is one of the best-studied bird of the world. LIFE FALKON significantly contributed to building huge datasets (e.g. movement, occurrences, distribution, population size) that would foster scientific research and conservation for years to come. - Awareness campaigns have paved the ground for potential future interventions involving either children (i.e. educational world), building technicians/architects or farmers in the Project Areas and beyond - The know-how developed during the realization of the project would make it extremely easy to replicate/expand actions in a future project with related objectives, compared to the effort that originally required LIFE FALKON to get started. - The experience of the 'lesser kestrel' beer project and the research findings about market-based biodiversity solutions (see LIFE FALKON team paper Assandri et al. 2023) suggests how to improve economically viable productive ways that could maintain or even restore farmland biodiversity - Having clear that 'simple' over-heating within nestboxes is a major problem for lesser kestrels in many parts of its breeding range, as also emerged during the round table at the LIFE FALKON Closing Conference, it would be worth to develop heath-resistant nestboxes for the future - If approved, the EU Restoration Law may significantly change the aspect and the diversity of agricultural landscape all over the continent. To study whether lesser kestrel and farmland birds may benefit from this environmental law would be a target objective in the near future.	- Climate warming is seriously threatening the long-term persistence of lesser kestrels, as recent findings confirm (e.g. LIFE FALKON team paper: Corregidor-Castro et al. 2023). - Extreme weather events are every year more frequent (such as the floods of May 2023 in N Italy and those of September 2023 in Greece), nesting structures may require extraordinary maintenance earlier than predicted, potentially posing problems for funding the interventions. - Despite the overall positive trend recorded in the 2016-2023 period, strong yearly oscillations characterize the small target populations, which remain intrinsically vulnerable to unforeseeable events. - The expected strong expansion of inshore and off-shore windfarms at a continental scale in the coming years will exponentially intensify the threat to lesser kestrel long-term persistence since the species is highly exposed to collision risk with wind turbines. - Intensification of agriculture and sudden changes in management policies may jeopardize years of conservation efforts at local scale in case of unfavourable interventions, in an unpredictable way. - Not only climate warming in EU but droughts in the wintering quarters are pivotal drivers of lesser kestrel population size. Little can be done to buffer such effects, as only limited conservation policies are targeting biodiversity in the Sahel region. - Implementation of EU environmental law regarding protection of nesting sites of protected species are not well-adopted and not appropriately applied in the case of building-nesting species such as the lesser kestrel.

4- After-LIFE Conservation Plan

The After-LIFE Conservation Plan has been realised to serve as a comprehensive blueprint for overseeing and maintaining the outcomes generated by the LIFE FALKON during the five years following its conclusion, spanning from 2024 to 2028. The design of this plan is rooted in the achievements of the LIFE FALKON project and a thorough SWOT analysis, as detailed above. Its overarching objectives aim at addressing and rectifying identified weaknesses, harnessing recognized opportunities, and proactively mitigating or averting potential threats, ensuring a robust and sustainable approach to post-project conservation efforts. It is structured into 7 Objectives and 13 Actions.

4.1 Objectives

OBJ 1 - Obtain regular (possibly yearly) estimates of the population size within PAs and monitoring the nesting structures installed by LIFE FALKON (i.e. nestboxes, nesting towers, nest complexes).

OBJ 2 - Obtain regular (possibly yearly) estimates of the breeding success of individuals breeding in the nesting structures installed by LIFE FALKON.

OBJ 3 - Ensure functionality of the nesting structures, including maintenance or adaptation interventions where needed.

OBJ 4 - Continue monitoring of GPS-tagged individuals (juveniles and adults), including those breeding out of the PAs but related to the Project (i.e. Matera, southern Italy).

OBJ 5 - Maintain and consolidate the community of professional researchers and conservationists formed during the project, potentially profiting to conceive future large-scale shared conservation and/or research initiatives.

OBJ 6 - Maintain the main communication channels (social media) of the Project during the After-LIFE period.

OBJ 7 - Disseminate project outcomes within the conservationist and scientific communities, and share the know-how and the replicability of successful practices developed through LIFE FALKON, both among other conservationists and among key stakeholders.

These objectives will be achieved through a total of 13 Conservation and Dissemination Actions, which may be transversal across objectives. These actions will be mainly funded by personnel hours, as stated by each

Beneficiary since the Application Form of LIFE FALKON. Specifically, the personnel costs originally declared for the After-LIFE period summed up to 35,000 € but this was updated due to the aim of realization of further activities. In case of need of extra funds additional to those of personnel, each Beneficiary will provide to raise them from other sources (i.e. institutional funds or by means of specific new financing tools). See Chapter 5 for an estimation of After LIFE actions costs.

4.2 Conservation Actions in the AFTER Life

Action 1 *- Yearly population census and monitoring of nesting structures* ***(OBJ 1 and OBJ 2)***

Perform yearly lesser kestrels population surveys in all of the Project Areas. For Greek PAs, the census will be focused on the core intervention areas. For the Italian PA, censuses will include the surveys of the wild colonies of central and Eastern Po plain known up to 2023. In all the PAs, all the installed nesting structures will be visited at least once per year during the breeding season aiming to assess their occupation by lesser kestrel and other species. All the data will be stored in a proper dataset, allowing the estimation of population trend and nestbox occupation rates. To favour the replicability and the maintenance over the long-term of the realization of the surveys, the survey techniques will be diffused in proper events (e.g. yearly meetings of local ornithological associations) with the aim to train new experts and to coordinate a network of trained people that will perform population surveys over the long-term. During these surveys, we will also collect and register data on the breeding success (number of eggs, number and age of the chicks, etc) for the nesting structures installed during LIFE FALKON.

Estimated costs

- PA1: 3000 €/year (Personnel costs + own funds for travels by CNR-IRSA, UMIL, ISPRA)
- Greek PAs: 1500 €/year (Personnel costs + own funds for travels by HOS)

Action 2 *- Scientific ringing campaigns* ***(OBJ 1 and OBJ 2)***

Adults and chicks hatched into artificial nesting structures of the different PAs will be opportunistically ringed and measured, allowing to collect data at the individual level (i.e. survival, recruitment, breeding performance etc.). The use of darvic rings will be abandoned after the stock of currently available rings is exhausted since it has been proved that this kind of ring gives important rewards (i.e. remote-distance observations) only on very rare occasions and that birds may be able to remove them after a short period of time.

Estimated personnel costs: none additional to those of the previous action. Ringing will be performed opportunistically during the monitoring. Costs of material fall into those of normal functioning of the involved Beneficiaries (CNR-IRSA, UMIL, ISPRA, HOS)

Estimated costs

- PA1: 500 €/year (Personnel costs + own funds for travels by CNR-IRSA, UMIL, ISPRA)
- Greek PAs: 300 €/year (Personnel costs + own funds for travels by HOS)

Action 3 *- Maintenance of functionality of nestboxes and nest complexes* ***(OBJ 3)***

Being possibly the most important of the After LIFE plan actions, is also those most problematic to maintain. While beneficiaries of LIFE FALKON can easily grant the contribution of its own personnel during the After LIFE period, in case of the need for refurbishment or extraordinary maintenance of nestboxes, nest complexes or nesting towers, additional resources will need to be achieved. It should be stressed that all nesting facilities installed by LIFE FALKON have been conceived to last for years, so that t is to be expected that only minimal or no maintenance will be necessary by 2028. However, extraordinary meteorological events are more common every year, from extreme heat waves to floods. The set of agreements that LIFE FALKON signed with the owners of the nesting towers and of the places where nestboxes have been installed should g(see Action A2) grant an economic support in case of need for intervention. The set of nestboxes installed on electrical poles in PA1 are however out of these agreements. In case of a need for maintenance, the LIFE FALKON team will operate to update the agreement with e-distribuzione (the public body that manages electricity transport in Italy and that is installed for free these nestboxes), potentially asking for economic support for maintenance and refurbishing.

Estimated costs

- PA1: 2000 €/year (Personnel costs + own funds for travels and materials for ordinary maintenance by CNR-IRSA, UMIL, ISPRA)
- Greek PAs: 500 €/year (Personnel costs + own funds for travels and materials by HOS)

Action 4 *- Maintain the monitoring of lesser kestrels deployed with biologging devices and potentially deploy further GPS tracking devices* ***(OBJ 4)***

Up to late summer 2023, several of the birds that have been deployed with GPS loggers during LIFE FALKON during 2019-2022 period were still alive, and is therefore likely that at least a

proportion of these birds will be back from Africa in 2024 and following years. Therefore, in the PAs where birds carrying GPS dataloggers were still active in 2023, we will timely set up the base stations in 2024 and, in case of further birds still transmitting, also in the following years.
Four of the partners that have been Beneficiaries of LIFE FALKON (namely, CNR-IRSA, HOS, ISPRA and UMIL) have several active research lines centred on movement ecology. In a case, a new research project partly building on LIFE FALKON achievements, has been already funded (WARMBREED project, funded under the MUR-PRIN 2022 call; partners: UMIL; CNR-IRSA, Univ. of Padua). It is therefore predictable and advisable that along with the monitoring of the birds that have been deployed with biologging devices during LIFE FALKON, further birds from different areas will be equipped with GPS or biologging devices of new generation (i.e. multi-sensors GPS/GSM).

Estimated costs

- Base stations will be set up and data will be downloaded by CNR-IRSA, UMIL, ISPRA and HOS during monitoring activities; hence with no additional costs.
- PA1: 10,000 € once (Personnel costs + own funds for travels and devices by CNR-IRSA, UMIL, ISPRA)

Action 5 *- Maintenance of common datasets across PAs and sharing them with international experts* ***(OBJ 5 and OBJ 7)***

During LIFE FALKON, as well as during the After LIFE period, several datasets were collected (see above). To maintain these datasets updated and accessible among the former Beneficiaries of LIFE FALKON is the main aim of this action. Along with the occupation rate of nesting structures and population size data of each PA, the collection of movement data through biologging devices is one of the main achievements of LIFE FALKON. These datasets have attracted several international collaborations and conservation-oriented scientific research. It is advisable that these connections are not only maintained but also strengthened and increased in the years to come.

Estimated costs

- PA1: 1000 €/year (Personnel costs by CNR-IRSA, UMIL, ISPRA)
- Greek PAs: 300 €/year (Personnel costs by HOS)

Action 6 *- Continuous training of new research expert personnel* ***(OBJ 1, OBJ 2, OBJ 5, and OBJ 7)***

The presence of volunteers and trained amateurs who are interested in nature conservation and willing to play an active role is an essential prerequisite for the implementation of conservation

projects and monitoring actions. For this reason, we believe it is important to train a new generation of amateurs and conservationists who will take care of the lesser kestrel, as well as animal species with similar ecological requirements, and of suitable habitats in the next future. The recruitment of new conservationists, amateurs and professionals is crucial for the long-term sustainability of the core objectives of the LIFE FALKON project and the monitoring of lesser kestrel populations settled along the northern breeding range of the species. Four of the partners that have been Beneficiaries of LIFE FALKON (namely, CNR-IRSA, HOS, ISPRA and UMIL) will develop training opportunities through specific courses, participation in monitoring activities, but also through BSc and MSc theses based on the data collected in the project areas.

Estimated costs

- PA1: CNR-IRSA, UMIL, and ISPRA will implement this action within their own institutional activities
- Greek PAs: 500 €/year (Personnel costs by HOS)

Action 7 *- Drafting of a shared concept note for a future wide-scaled conservation or research project* ***(OBJ 3, OBJ 5, and OBJ 7)***

The extensive network of connections among lesser kestrel researchers and avian conservationists, which was established during the Project, served as the foundation for the LIFE FALKON Closing Conference held on Lemnos Island (PA4) in October 2023. The conference was attended by a subgroup of these experts, those who were able to make the journey to this remote island despite their busy schedules. In total, 37 experts from 7 Mediterranean countries participated in the event. This select group engaged in extensive discussions over the course of the densely scheduled conference days, highlighting the pressing need to continue interventions and actions in support of lesser kestrels. Looking ahead, the LIFE FALKON team's objective is to address this urgency by initiating a concrete dialogue that involves all the attendees of the Lemnos conference, as well as other partners from the Mediterranean region who were unable to attend. The ultimate goal is to produce a concept note for future conservation projects. This note will serve as a standalone document, effectively sounding a call for urgent actions in support of lesser kestrels. It will also serve as the core of future project applications, possibly within the LIFE program or through other conservation funding channels.

Estimated costs

- PA1: 2000 € once (Personnel costs by CNR-IRSA, UMIL, ISPRA)
- Greek PAs: 1000 €/year (Personnel costs by HOS)

4.3- Dissemination plan

Dissemination actions are organized and detailed in Table 2 to enhance the transparency and clarity of the After-LIFE dissemination plan's structure. The numbering of the actions continues from that of the conservation actions.

Table 2. Lists of Dissemination and Communication actions planned for the After-LIFE period (2024-2028)

ACTION NAME	ACTIVITIES	IMPLEMENTED BY	AVERAGE ESTIMATED YEARLY COST	FUNDING SOURCES
Action 8 - Maintenance of website **(OBJ 6)**	Every 6 months maintenance.	ALDA; CNR-IRSA; ISPRA; UMIL; HOS	€ 500/year	Personnel costs
Action 9 - Dissemination of achieved results, documentary, and best practice handbook during conferences **(OBJ 5 and 7)**	Participation or contribution to two national/international conference/meeting or workshop every year (two in total for the whole beneficiaries)	CNR-IRSA; ISPRA; UMIL; HOS	€2.000/year	Personnel costs + own funds
Action 10 - Dissemination of achieved results and best practice handbook through scientific papers **(OBJ 5 and 7)**	Production of 1 or 2 paper every year, at least partly) based on the findings of LIFE FALKON	CNR-IRSA; ISPRA; UMIL; HOS	€1.000/year	Personnel costs + own funds
Action 11 - COI annual online meeting **(OBJ 5)**	Inviting COI members to take part to one annual meeting with updates and share of new best practices that emerged	ALDA; CNR-IRSA; ISPRA; UMIL; HOS	€1.000/year	Personnel costs
Action 12 -Supporting COI during the year **(OBJ 5, 6 and 7)**	Every year short newsletter about national\international workshops and conferences about birds conservation \ lesser kestrel, and updates on new results achieved.	ALDA; CNR-IRSA; ISPRA; UMIL; HOS	€500/year	Personnel costs
Action 13 - Social media posts **(OBJ 6)**	One social media post every 6 months on facebook and twitter.	ALDA	€500/year	Personnel costs

5. Costs resuming table of the After LIFE plan

	Action	Site	Yearly cost	Total cost (5yrs)
CONSERVATION ACTIONS	*Action 1*	PA1	2,500 €	12,500 €
		Greek PAs	1,500 €	7,500 €
	Action 2	PA1	500 €	2,500 €
		Greek PAs	300 €	1,500 €
	Action 3	PA1	2,000 €	10,000 €
		Greek PAs	1,000 €	5,000 €
	Action 4	PA1	Once in the AfterLIFE	10,000 €
		Greek PAs	not involved	0 €
	Action 5	PA1	1,000 €	5,000 €
		Greek PAs	300 €	1,500 €
	Action 6	PA1	0 €	0 €
		Greek PAs	500 €	2,500 €
	Action 7	PA1	Once in the AfterLIFE	2,000 €
		Greek PAs	Once in the AfterLIFE	1,000 €
DISSEMINATION ACTIONS	*Action 8*	All PAs	500 €	2,500 €
	Action 9	All PAs	2,000 €	10,000 €
	Action 10	All PAs	1,000 €	5,000 €
	Action 11	All PAs	1,000 €	5,000 €
	Action 12	All PAs	500 €	2,500 €
	Action 13	All PAs	500 €	2,500 €
	Totals COSTS		**15,100 €** Yearly	**88,500 €** Overall 5 yrs

6. References

Assandri, G., Bazzi, G., Siddi, L., Nardelli, R., Cecere, J. G., Rubolini, D., & Morganti, M. (2023). The occurrence of a flagship raptor species in intensive agroecosystems is associated with more diverse farmland bird communities: Opportunities for market-based conservation. *Agriculture, Ecosystems & Environment*, *349*, 108441.

Corregidor-Castro, A., Morinay, J., McKinlay, S. E., Ramellini, S., Assandri, G., Bazzi, G., ... & Rubolini, D. (2023). Experimental nest cooling reveals dramatic effects of heatwaves on reproduction in a Mediterranean bird of prey. *Global Change Biology*, *29*(19), 5552-5567.

Morganti, M., Preatoni, D., & Sarà, M. (2017). Climate determinants of breeding and wintering ranges of lesser kestrels in Italy and predicted impacts of climate change. *Journal of Avian Biology*, *48*(12), 1595-1607.