

Common farmland birds in Italy

Update of population trends and Farmland Bird Indicator
for the National Rural Network



These publications are dedicated to Paolo Boldrighini, Sergio Frugis, Gaspare Guerrieri, Helmar Schenk and Giuseppe Tormen

Document produced by the Ministry of agriculture, food and forestry (Ministero delle politiche agricole, alimentari e forestali) as part of the activities of the National Rural Network (Rete Rurale Nazionale).

Editorial coordination
Laura Silva (Lipu)

Texts
Mattia Brambilla; Laura Silva (Lipu)

Translators
Ottavio Janni, Laura Silva (Lipu)



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Thanks also

Paolo Ammassari, Giuseppe Blasi, Emilio Gatto (MiPAAF); Antonella Trisorio (CREA); Rossana Bigiardi, Claudio Celada, Marco De Silvi, Marco Dinetti, Giorgia Gaibani, Marco Gustin, Federica Luoni, Andrea Mazza, Silvia Maselli, Greta Regondi, Elena Rossini, Massimo Soldarini e Danilo Selvaggi (Lipu); Simona Tedesco; Alessandro Magrini (AFNI); Tommaso Campedelli, Simonetta Cutini, Guglielmo Londi, Guido Tellini Florenzano (soc. D.R.E.Am. Italia); Paolo Bonazzi, Lia Buvoli (studio FaunaViva); Gianpiero Calvi (studio Pteryx).

From Lipu, thanks to AFNI (Association of Italian Naturalist Photographers) and to all the authors of the beautiful pictures that enrich this brochure and which were taken according to an idea of photography inspired by ethics, respect for nature and full responsibility of the photographer towards the subjects represented.

Design and layout

Andrea Ascenso

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Recommended citation

Rete Rurale Nazionale & Lipu (2020). Common breeding farmland birds in Italy. Update of population trends and Farmland Bird Indicator for National Rural Network 2000-2020.

Cover photo

Common starling by Lorenzo Magnolfi

The Farmland Bird Index

The Farmland Bird Index (FBI) has again been confirmed in the next plan of the Common Agricultural Policy (2021-2027) as a context indicator that can represent the health of European and national agricultural habitats. Composite or aggregate indicators measure multi-dimensional concepts such as environmental quality, which cannot be captured by individual indexes.

The requisites of composite indicators are spatial and temporal comparability, the non-replaceability of elementary indicators - such as in our case, the population indexes of the bird species that make up the composite indicator -, simple and transparent calculations, the immediate accessibility and interpretation of the results obtained, and finally their robustness.

The indicators obtained to evaluate population trends for birds of farmland areas and birds of open montane habitats are respectively the **Farmland Bird Index (FBI)** and the **Index of montane grassland birds (FBI_{pm})**.

Within the framework of the rural development policy, the FBI is used by the National Rural Network to describe the context within which the National Rural Development Plan (PSRN) operates. Since 2009, the FBI has been calculated for each region as well; regional technical reports are available at <http://www.reterurale.it/farmlandbirdindex>.

Farmland Bird Index trends continue to decline, as they have over the last 10 years.

In 2020 the FBI value amounted to 71,2% of

its initial value in 2000. There are 28 species that are used to calculate the indicator (table on page 10). Of these, 18 are decreasing while 5 are stable and 5 are increasing.

When the Farmland Bird Index is calculated for lowland areas only, it is far worse than that for Italy as a whole, with a decline of -46,3%. For the current planning period the EU and Italy had scheduled actions and a dedicated budget to contribute to environmental goals and reverse biodiversity declines, both under the second pillar of the CAP (rural development) and the first pillar, with the introduction of greening obligations, and with regards to conditionality rules as well.

Nevertheless, as the European Court of Auditors pointed out, the CAP remained strongly oriented towards intensive agriculture, with a limited impact on environmental and social components.

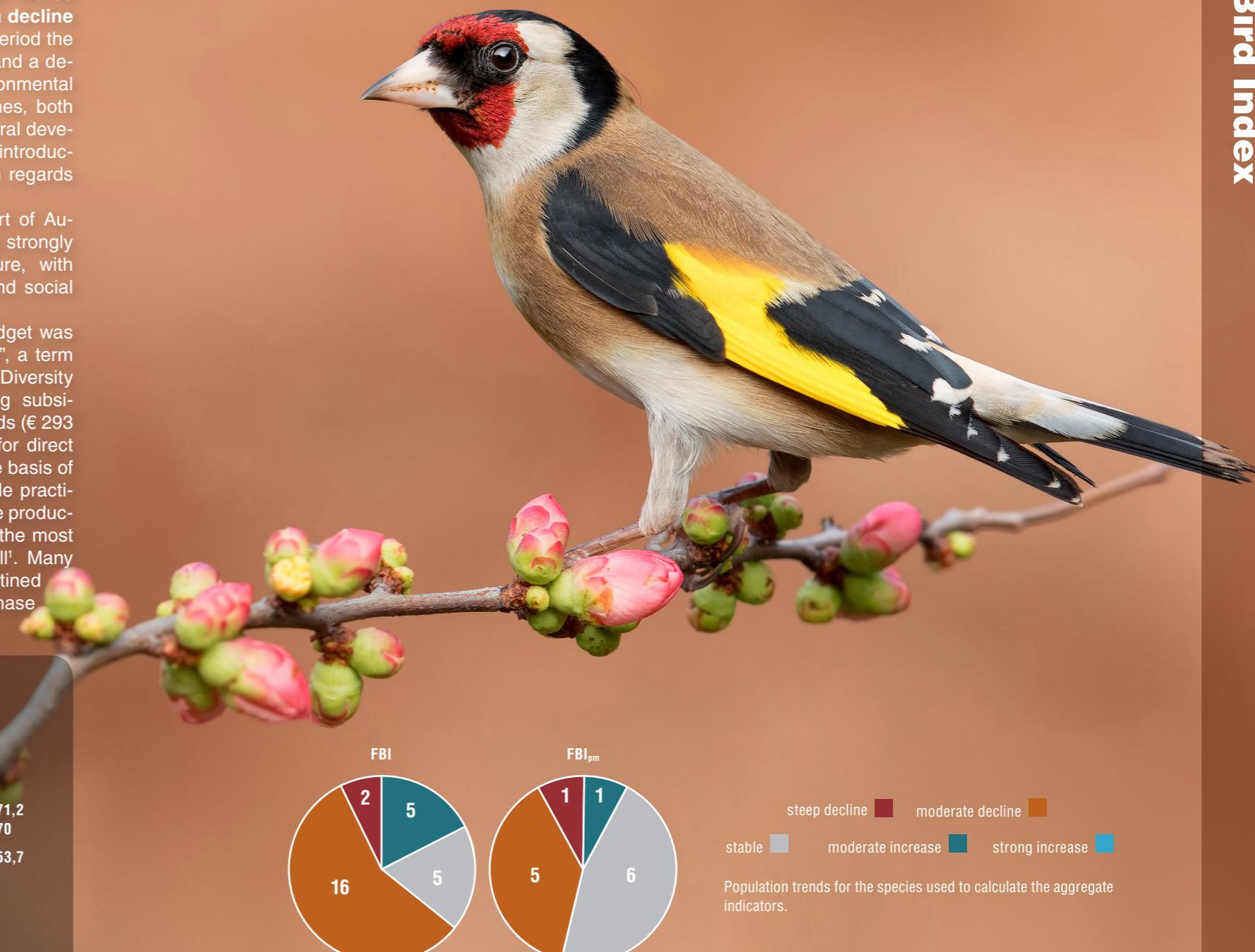
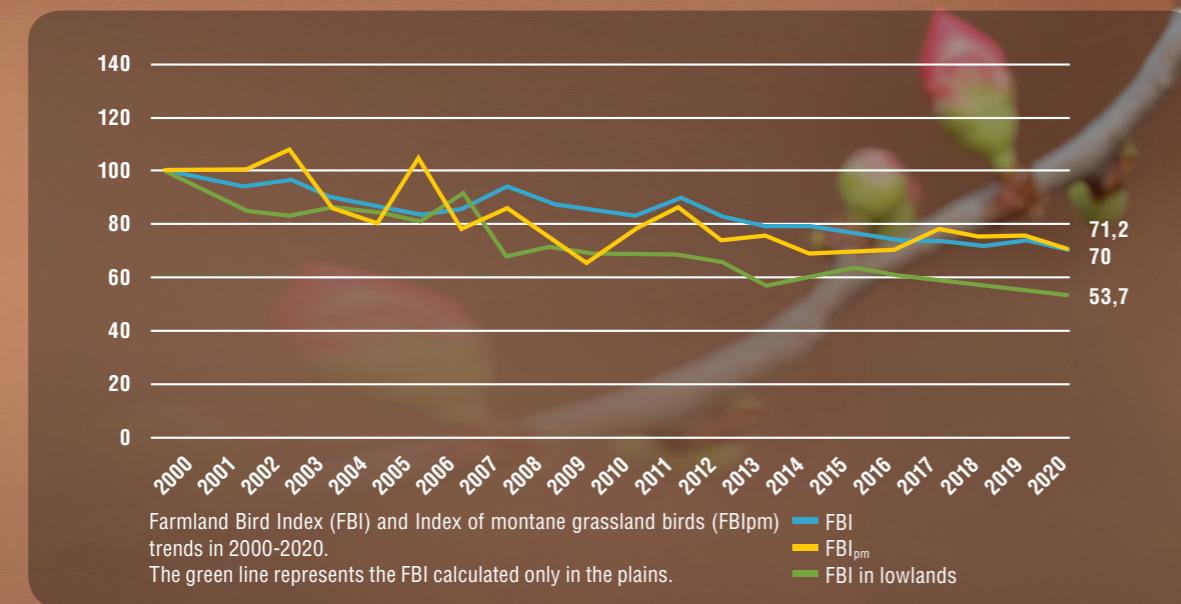
Many measures (to which a high budget was allocated) were defined as "perverse", a term used by the Convention on Biological Diversity to indicate environmentally-damaging subsidies. Almost three-quarters of the funds (€ 293 billions for 2014-2020) are destined for direct payments, which are disbursed on the basis of surface area regardless of sustainable practices or standards, in order to favour the production of cereals and livestock, among the most intensive and harmful practices of all¹. Many resources under the second pillar destined for "investment aid", such as the purchase

of heavy machinery, the construction of processing plants or the building of pens for intensive livestock farming also encouraged intensification.

Adequate funds for specific dedicated measures, together with rules and incentives to encourage a transition towards "green" agriculture would have provided more impetus for initiatives to reverse the biodiversity loss caused by intensification.

On the basis of the above and a careful analysis

of the Farmland Bird Index - calculated on a national and regional scale for ten years now - which unequivocally paints a dramatic picture of the health of our countryside, we hope that the new Common Agricultural Policy, and especially the National Strategic Plan Italy will have to draft, can become the engine of an agriculture that is more respectful of health and the environment.



¹ Atlante della PAC - Dati e fatti della Politica Agricola Comune UE, 2019

The Farmland Bird Index projects

12 years of research on birds breeding in farmland areas in Italy

Skylarks, Barn Swallows, Goldfinches, and Italian Sparrows are all species that were once abundant but that have seen their populations decline by more than half between 2000 and 2020. In the same timeframe, the Wryneck has declined by 68%, as the Stonechat (-68%), the Tawny Pipit by 70% and the Red-backed Shrike by 65%. These numbers are frightening and leave no room for doubt, as they are underpinned by a sound database collected through field surveys, initially through the MITO2000 project between 2000 and 2008, and in the twelve subsequent years by the FBI project. As many as 310 professional ornithologists and Lipu volunteers participated in this second part of the project, which was supported and funded by the National Rural Network and monitors common breeding birds in Italy¹. Since 2000, the total number of people involved is 526. The continuity of the surveys, which has been guaranteed over time by an extensive network of field ornithologists and by the funds made available by the Ministry of Agricultural, Food and Forestry Policies (MiPAAF) has made it possible to collect a robust set of data that is comparable over time and to achieve a nearly complete historical series². This field work resulted in the most valuable data base on Italian birds, which currently contains 1,533,956 records resulting from 143,000 ten-minute point counts, for a total of 23,884 hours of field observations covering a surface area of nearly 10% of Italy's entire territory. The complex team that supports the programme has been able to improve and renew itself over time, augmenting the

base of knowledge and skills acquired during the MITO2000 project, which was exclusively based on volunteers. The project, which is coordinated by Lipu, involved a number of local ornithological associations and a wide network of field ornithologists, many of whom with decades of experiences, organized at a local scale under the supervision of regional or provincial coordinators. It is a one-of-a-kind example in Italy in terms of its duration and geographic scope.

The final data, after 12 years of the Farmland Bird Index project, indicate a general crisis affecting agricultural habitats, which are quite diverse in Italy, ranging from extensive monoculture in the Po Plain to habitat mosaics dominated by vineyards and olive groves in hilly areas, to mountain pastures, where various and sometimes opposing processes have created an extremely negative situation for biodiversity. One of the most important such causes is the emergence of an increasingly intensive form of industrial agriculture, which has taken over most of the fertile lowland areas (and some of the most suitable hilly areas). This has reduced the availability of food resources and suitable habitats, together with possible nesting and roosting sites. Indeed, the worst situation is in the lowlands, where the decline in the value of the indicator (-46%) is quite worrying and much worse than the indicator calculated at the national level or

for mountain and hilly areas. This is confirmed by FBI values calculated at the regional scale and by population trends for individual species, which are doing far worse in the Po Plain (Lombardy, Emilia-Romagna and Veneto) compared to the south. The flipside to this is the widespread abandonment of farming and shepherding in mountain areas, leading to a loss of meadows and grasslands and the gradual return of woodlands, to the detriment of typical species of open areas, which are once again losing habitat and resources.

The disappearance of birds from our countryside, which is still ongoing, is the most evident and tangible aspect of a much broader and more

complex environmental degradation process. Birds are high up on the food chain and serve as excellent indicators thanks to their environmental sensitivity; the fact that they are doing poorly indicates that the entire ecosystem is suffering. As birds disappear, so do wild plants, seeds, and invertebrates, including those that live in the soil and those that serve as pollinators, which are crucial for soil health and for agriculture itself. It is only by working together with farmers to change the current agricultural paradigm that we will be able to reverse the current decline in the biodiversity of farmland, which covers one-third of Italy's territory and hosts a significant proportion of the national population.



Bird monitoring activities create an essential database for nature conservation. Data from monitoring programmes are crucial in order to calculate population trends in the subset of species used for synthetic indicators such as the Farmland Bird Index (FBI) and the Index of montane grassland birds (FBI_{pm}). These data also provide important information on presence/absence, population density, distributions, conservation status, and population trends for other species as well. In fact, the project's database was also used for the reporting effort under article 12 of the Birds Directive, to draft the 2019 Red Data List of birds breeding in Italy, for the Italian Breeding Bird Atlas, and for the European Breeding Bird Atlas (EBBA2). The project's contributions to other important initiatives enhance the value of the database itself, whose use was granted by MiPAAF, while improving the efficacy and robustness of conservation tools and policies in the service of the public good.

¹ except in Umbria, where an excellent project funded by the Region is in place that has a higher sampling effort compared to the present project, to whose database it contributes.

² in some regions the historical series is missing one or more years between 2004 and 2008, but has then resumed every year from 2009 to 2020.

Population trends between 2000 and 2020

The table on the following page shows population trends of common birds in Italy between 2000 and 2020; these are the species used to calculate the Farmland Bird Index (FBI) and the Index of montane grasslands birds (FBI_{pm}), at the national level.

Species name (common name) and the **Scientific name** are given in the first two columns. In order to make the information contained in the table more legible and accessible, the species are listed alphabetically by common name and not in taxonomic order.

Average annual variation ± SE (%) represents the average percentage change per year with its standard error (SE). The standard error is a measure of the inaccuracy of the index, and thus is a proxy for its reliability, over the entire monitoring period.

Trend classification 2000-2020 describes, with the use of arrows and colours, population trends classified as follows (definitions recommended by EBCC):

- **strong increase** ▲▲ a trend slope of >1.05 (an increase of more than 5% per year), with the lower confidence limit of the slope >1.05;
- **moderate increase** ▲ a trend slope between 1.00 and ≤1.05 (an increase of no more than 5% per year), with the lower confidence limit of the slope between 1.00 and 1.05;
- **stable** ● a trend slope where the confidence intervals overlap 1 (no significant change), with the lower confidence limit of change >0.95 and upper confidence limit of change <1.05;
- **moderate decline** ▼ a trend slope of ≥0.95 and 1.00 (a decline of no more than 5% per year), with the upper confidence limit of the slope between 0.95 and 1.00;
- **steep decline** ▼▼ a trend slope of <0.95 (a decline of more than 5% per year), with the up-

per confidence limit of the slope <0.95; A low number of individuals recorded and/or a high standard error can make these trends non-significant. Should this happen, the population is prudentially categorized in the lower category for positive trends (*moderate increase instead of strong increase, stable instead of moderate increase*) or in the higher one for negative trends (*moderate decline instead of steep decline, stable instead of moderate decline*).

- **uncertain** ? a trend slope where the confidence intervals overlap 1 (no significant change), with the lower confidence limit of change <0.95 and/or the upper confidence limit of change >1.05.

The **Squares** column reports the number of 10x10 km squares from which data was used to calculate trends for each species, namely the number of squares visited at least twice in 2000-2020 in which the species in question was recorded. This makes it possible to compare sample size between species. A total of 1.365 10x10 km squares were used for the analyses.

The **Indicator** column divides bird species on the basis of their habitat preferences at the national scale:

- birds of farmland habitats whose population trends are used to calculate the Farmland Bird Index (FBI),
- species used to calculate the Index of montane grasslands birds (FBI_{pm}).

In order to provide as exhaustive a picture as possible, we also included additional information, drawn from other studies conducted at the national level, on the species for which the project presents population trends.

The **Conservation status** column provides information on each species' conservation status as follows:



• Favourable conservation status

Stable or expanding range and population, number of pairs and demographic parameters showing no signs of concern, habitat quality and extension are compatible with the species' long-term survival;

• Inadequate conservation status

The population or range has declined over the last 10 years (no more than 10%), or the population/range is highly concentrated/fragmented/fluctuating, or lower than the favourable reference values, and/or the extent of their habitat appears to be insufficient with the species' long-term survival;

• Poor conservation status

The population or range has declined significantly, or have fallen by more than 10% in the last ten years, or the population is significantly lower than the favourable population reference values, and/or their habitat has been significantly degraded or reduced.

For more information on the methodology used

for defining the conservation status of Italian birds, see these publications^{1,2}.

Finally, the **Red List** columns indicates the threat status for every species in the 2019 Red List of Italian breeding birds: Critical (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT), Data Deficient (DD), Least Concern (LC). The threat categories VU, EN and CR are applied – in ascending order from least to most serious - to the species that have a high to critical level of extinction at the national level in the short or middle term; NT is applied to species at concrete risk of qualifying for a threat category in the near future; DD is applied of species for which there is not enough data to evaluate their risk of extinction; LC is applied to species that are not under immediate threat of extinction (but they can still be slowly declining and/or relatively rare). For more information on the categories and criteria used to compile the national Red List please see the relevant publication³.

¹Brambilla M., Gustin M., Celada C., 2013. Species appeal predicts conservation status. Biol. Conserv. 160, 209–213

²Gustin, M., Brambilla, M., Celada, C., 2016. Stato di conservazione e valore di riferimento favorevole per le popolazioni di uccelli nidificanti in Italia. Rivista Italiana di Ornitologia, 86 (2), 3-58

³Gustin M., Nardelli R., Brichetti P., Battistoni A., Rondinini C., Teofili C. (compilatori), 2019. Lista Rossa IUCN degli uccelli nidificanti in Italia 2019. Comitato Italiano IUCN e Ministero dell'Ambiente e della Tutela del Territorio e del Mare, Roma

Species name	Scientific name	Annual change ± SE (%)	Trend classification 2000-2020	Squares	Indicator	Conservation status	Red List
Barn Swallow	<i>Hirundo rustica</i>	-1.51 (±0.16)	▼	1263	FBI	■	NT
Black Redstart	<i>Phoenicurus ochruros</i>	1.49 (±0.29)	▲	580	FBI _{pm}	■	LC
Calandra Lark	<i>Melanocorypha calandra</i>	-3.30 (±0.99)	▼	77	FBI	■	VU
Carrion Crow	<i>Corvus corone</i>	0.21 (±0.52)	●	223	FBI _{pm}	■	LC
Common Kestrel	<i>Falco tinnunculus</i>	0.38 (±0.22)	●	1139	FBI	■	LC
Common Nightingale	<i>Luscinia megarhynchos</i>	0.09 (±0.13)	●	1045	FBI	■	LC
Common Redpoll	<i>Acanthis flammea</i>	-7.27 (±0.90)	▼▼	92	FBI _{pm}	■	EN
Common Starling	<i>Sturnus vulgaris</i>	0.03 (±0.22)	●	896	FBI	■	LC
Corn Bunting	<i>Emberiza calandra</i>	0.97 (±0.19)	▲	825	FBI	■	LC
Crested Lark	<i>Galerida cristata</i>	-1.03 (±0.20)	▼	522	FBI	■	LC
Dunnock	<i>Prunella modularis</i>	-0.75 (±0.49)	●	181	FBI _{pm}	■	NT
Eurasian Golden Oriole	<i>Oriolus oriolus</i>	2.10 (±0.19)	▲	877	FBI	■	LC
Eurasian Hoopoe	<i>Upupa epops</i>	-0.66 (±0.23)	▼	861	FBI	■	LC
Eurasian Magpie	<i>Pica pica</i>	2.05 (±0.13)	▲	1059	FBI	■	LC
Eurasian Skylark	<i>Alauda arvensis</i>	-3.28 (±0.21)	▼	739	FBI	■	VU
Eurasian Tree Sparrow	<i>Passer montanus</i>	-2.48 (±0.21)	▼	1017	FBI	■	LC
Eurasian Wryneck	<i>Jynx torquilla</i>	-6.09 (±0.39)	▼▼	592	FBI	■	EN
European Goldfinch	<i>Carduelis carduelis</i>	-2.80 (±0.12)	▼	1322	FBI	■	NT
European Greenfinch	<i>Chloris chloris</i>	-3.22 (±0.15)	▼	1205	FBI	■	VU
European Serin	<i>Serinus serinus</i>	-0.40 (±0.12)	▼	1267	FBI	■	LC
European Stonechat	<i>Saxicola rubicola</i>	-6.58 (±0.24)	▼▼	930	FBI	■	EN
European Turtle Dove	<i>Streptopelia turtur</i>	-1.38 (±0.15)	▼	1030	FBI	■	LC
Fieldfare	<i>Turdus pilaris</i>	-3.45 (±0.77)	▼	104	FBI _{pm}	■	VU
Garden Warbler	<i>Sylvia borin</i>	-5.85 (±0.93)	▼	101	FBI _{pm}	■	EN
Greater Short-toed Lark	<i>Calandrella brachydactyla</i>	-0.17 (±0.87)	●	141	FBI	■	LC
Hooded Crow	<i>Corvus cornix</i>	0.80 (±0.12)	▲	1235	FBI	■	LC
Italian Sparrow	<i>Passer italiae</i>	-3.15 (±0.15)	▼	1150	FBI	■	VU
Lesser Whitethroat	<i>Sylvia curruca</i>	1.52 (±0.79)	●	137	FBI _{pm}	■	LC
Northern Wheatear	<i>Oenanthe oenanthe</i>	-0.48 (±0.47)	●	222	FBI _{pm}	■	LC
Ortolan Bunting	<i>Emberiza hortulana</i>	-1.02 (±0.97)	●	110	FBI	■	DD
Red-backed Shrike	<i>Lanius collurio</i>	-4.46 (±0.27)	▼	804	FBI	■	VU
Ring Ouzel	<i>Turdus torquatus</i>	-0.50 (±0.96)	●	101	FBI _{pm}	■	LC
Spanish Sparrow	<i>Passer hispaniolensis</i>	-2.54 (±0.36)	▼	167	FBI	■	VU
Spotless Starling	<i>Sturnus unicolor</i>	4.43 (±0.58)	▲	149	FBI	■	LC
Tawny Pipit	<i>Anthus campestris</i>	-4.31 (±0.57)	▼	218	FBI	■	EN
Tree Pipit	<i>Anthus trivialis</i>	0.64 (±0.38)	●	292	FBI _{pm}	■	LC
Water Pipit	<i>Anthus spinolella</i>	-1.16 (±0.48)	▼	141	FBI _{pm}	■	LC
Western Yellow Wagtail	<i>Motacilla flava</i>	-2.04 (±0.31)	▼	324	FBI	■	NT
Whinchat	<i>Saxicola rubetra</i>	-2.53 (±0.80)	▼	121	FBI _{pm}	■	VU
White Wagtail	<i>Motacilla alba</i>	-1.16 (±0.21)	▼	1071	FBI	■	LC
Yellowhammer	<i>Emberiza citrinella</i>	-2.99 (±0.51)	▼	225	FBI _{pm}	■	VU



The conservation of farmland birds in Italy: challenges, research, and practical applications

The general collapse of bird populations in farmland habitats is a major cause for concern for European conservationists. This decline, which is catastrophic under certain aspects, has been ongoing for decades and shows no sign of slowing down. Italy hosts a significant percentage of the population of many of these species, and thus plays a key role in their conservation. In spite of this, until recently Italy was lagging far behind much of Europe in terms of research on the ecology and conservation of farmland birds. Limited research translates into limited knowledge and a narrow scope of action. Fortunately, this trend has rapidly reversed itself, and while farmland bird populations sadly continue to decline, research on birds and farmland has grown quickly in

recent years. This has helped build an invaluable base of knowledge to draft conservation strategies, propose measures, and evaluate action plans, thus offering a glimmer of hope. Although there have been several excellent recent examples of research results being applied in Rural Development Programmes and local or regional projects to improve habitats for farmland birds, the implementation of research findings into conservation policies and measures remains at an early stage. Below we will explore the most relevant aspects of farmland bird conservation in Italy. Looking at the conservation status of bird species that nest in agricultural habitats (not just those used to calculate the FBI), we see that birds that live in grassland habitats are those most at risk, while generalist species that

can occupy a variety of habitats are generally doing better. **This snapshot of conservation status as related to habitat agrees with the trends identified by the FBI, and immediately suggests that the habitats that have undergone the most profound changes in recent decades - many grassland habitats have indeed been converted, abandoned, or subjected to agricultural intensification - are also those associated with the most critical situations.**

The threats against birds of croplands exist mainly at the landscape and management levels. The former include changes in soil use and vegetation, which affect habitat composition and configuration at a wide scale, while the latter include farming practices such as pesticide and fertilizer use, pollarding, mowing, the use of machinery and crop protection systems.

Agricultural intensification and land abandonment are two diametrically opposed processes, yet they both result in a loss of diversity, with a transition from landscape mosaics to landscapes dominated by a single habitat (monoculture in the former case, and woodland in the latter). The geographical and environmental contexts in which these processes take place are different, yet the root cause is the same: the attempt to maximize profits, which leads to intensifying production in the most suitable areas and to the abandonment of marginal ones. The loss of habitat diversity implies the loss of micro-habitats and key resources for many species: hedgerows for nesting, meadows for foraging, trees from which to sing. Bird communities thus change, with population collapses for species that require habitat mosaics, such as shrikes and Ortolan Buntings. Agricultural intensification can degrade habitat quality: the increasing use of chemicals, more frequent mowing, the use of nets or all-out efforts to contain anything that is not the crop itself can make an habitat that may superficially appear unchanged inhospitable for many species. On the other hand, the lack of grazing or mowing due to abandonment has negative effects on species that live in open areas, including many insectivores such as the Black-eared Wheatear, Common Redstart or Tree Pipit.

The use of pesticides is a key factor. It can have both direct impacts (toxicity and long-term effects) and indirect ones (reduced food supply, nest disturbance). Differences due to pest management approaches (conventional, integrated or organic) vary between different types of crops and depending on the surrounding landscape. Generally speaking,

while the effects of pesticides on birds are potentially very significant, they remain little known. The species potentially most at risk are those tied to orchards and those that do not nest in cavities.

Many birds that nest in cultivated areas have low breeding success, often due to the impact of farming practices – ground-nesting birds often have their nests destroyed due to mowing and reaping, which affects larks, harriers, Quails and Whinchats – or due to the low quality of nesting and foraging habitats (as is the case for Wrynecks in certain vineyards and Red-backed Shrikes in intensive farmland). This creates potential “ecological traps”, where a species occupies seemingly suitable tracts of habitat but struggles to nest successfully due to limiting factors that are not immediately apparent.

This is exacerbated by the effects of a profoundly changing climate. In mountain grasslands, the effects of climate change and land abandonment work in tandem to significantly decrease the availability of suitable habitats for species such as the Tawny Pipit, Water Pipit and Northern Wheatear. The different speeds at which birds and farming practices adapt to climate change have an impact on numerous species, and crops once limited to lower elevations, such as vineyards, are rapidly advancing upslope.

Our increase in knowledge has not yet led to an equally clear speeding up of conservation initiatives. The contrasting effects of agri-environmental payments on the avifauna highlight the need for measures that are custom-made for the needs of wild birds. A degree of progress in this direction has been achieved, but much remains to be done. Several recent projects have seen farmers and researchers work together to define management protocols that could combine production and conservation. Additionally, farmland birds provide ecosystem services, both in cultural terms and with regards to regulating the populations of pests, and promoting ideal conditions for birds means improving many of the ecosystem services in the countryside.

Although many aspects remain poorly explored (demographic aspects, effects of pesticides, links with the non-breeding period), a few key steps to take are clear: planning measures at the proper scale, conserving (and restoring) grasslands through adequate management, protecting habitat diversity and edge habitats, properly managing ground vegetation in perennial crops, integrating conservation and ecosystem services aspects in strategies that must also be evaluated from an economic standpoint, increasing the avail-

ability of nesting sites, and limiting disturbance during the breeding season.

The efforts to be made are thus manifold, involving both farmers and institutions, and focusing not only on birds but also on the other advantages arising out of environmentally-friendly management.

The coming decades will be as dynamic as they will be crucial. A new CAP, a changing climate, pressure arising out of the production of renewable energy, an increased awareness of the impacts of industrial agriculture and climate change, a renewed need for contact with nature will all have major repercussions on the birdlife of our countryside. As with any challenges, with risks come opportunities: we all must work towards a healthy future filled with life, for farmland birds, for ourselves, and for the planet.



For more information: Brambilla M. 2019. Six (or nearly so) big challenges for farmland bird conservation in Italy. Avocetta 43: 101-113.

National financial supporters 2009-2020 - Italian Ministry of agriculture, food and forestry (Ministero delle Politiche Agricole, Alimentari e Forestali)

Local financial supporters, regional coordinators and counters for FBI project 2009-2020 (in alphabetical order):

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Financial supporter: 2009-2020 Arbeitsgemeinschaft für Vogelkunde und Vogelschutz – Südtirol

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