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Common farmland birds in Italy

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

LIPU

These publications are dedicated to Paolo Boldreghini, Mario Bonora, Sergio Frugis, Gaspare Guerrieri, Stefano Piciocchi, Helmar Schenk e Giuseppe Tormen

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Garden Warbler by Luca Villa

The **Farmland Bird Index**

Birds have been identified as an effective bio-indicator species due to their sensitivity to environmental changes, their easy contactability and their suitability for large-scale habitat monitoring. Considering these distinctive characteristics, the European Commission has designated the Farmland Bird Index as a context indicator within the Common Agricultural Policy (C36 in the 2023-2027 programming period, formerly C35 in the previous programming period), with the objective of assessing the efficacy of implemented actions and the condition of these habitats.

Since 2009, Lipu has been commissioned by the Ministry of Agriculture, Food Sovereignty and Forestry (MASAF, formerly Mipaaf) to calculate the FBI indicator as part of the **Farmland Bird Index (FBI)** project, linked to a previous census project named MITO2000 (Monitoraggio ITaliano Ornitologico). This project commenced in 2000 on a voluntary basis and utilized the same standard data collection protocol. In addition to the FBI indicator, for which **28 target species** strongly linked to agricultural environments are considered, a second indicator for montane grasslands is also calculated. This second indicator considers **13** species typical of montane grasslands and it is indicated as FBI_{pm}.

In 2024, the project reached its 25th year of activity, marking a significant achievement in its field. The project's unique status is characterized by two features: its duration and the breadth of its census area, confirming year after year its ability to provide robust data.

In 2024 the Farmland Bird Index (FBI) and the montane grassland index (FBI_{pm}) reached a value of 67.39 and 65.40 respectively (considering 100 as the initial value in the year 2000). The overall trend thus remains in decline, although the 2024 FBI value is slightly higher than that of 2023 (63.40; please note that the values of the entire historical series are recalculated annually on the basis of the updated database). On the other hand, a clear decline was recorded for the FBI_{pm}, which fell by almost eight percentage points from 73.34 in 2023. Among the 28 typical farmland bird species (FBI), more than 70% of them have recorded a significant decline in their population indices, in particular Eurasian Wryneck (-76.14%), European Stonechat (-71.06%), Tawny Pipit (-70.26%) and Eurasian Tree Sparrow (-65.62%) are the most affected by this decline. On the other hand, as far as the montane grassland species (FBI_{pm}) are concerned, 6 are declining, 6 are stable and the number of increasing species (Black Redstart) has been reduced to just one.

In terms of species trends, those that are less demanding from an environmental point of view, defined as 'generalists' that are likely to be less affected by anthropization and agricultural intensification, and thus result to be stable or increasing. On the other hand, 'specialist' species, due to their closer linked to specific environmental typologies1-3, are suffering more from the degradation of the landscape. Furthermore, a decline has been observed in many common species, which play a key role in ecosystem services and supporting numerous ecological processes. The more species and individuals there are, the more effective the ecosystem services they provide, and the greater the resulting well-being. It is therefore imperative to adopt conservation measures and actions for these bird species to ensure the preservation of both their and our well-being.

European Turtle Dove by Marco Fornasari De Silvi

25 years (2000 - 2024)

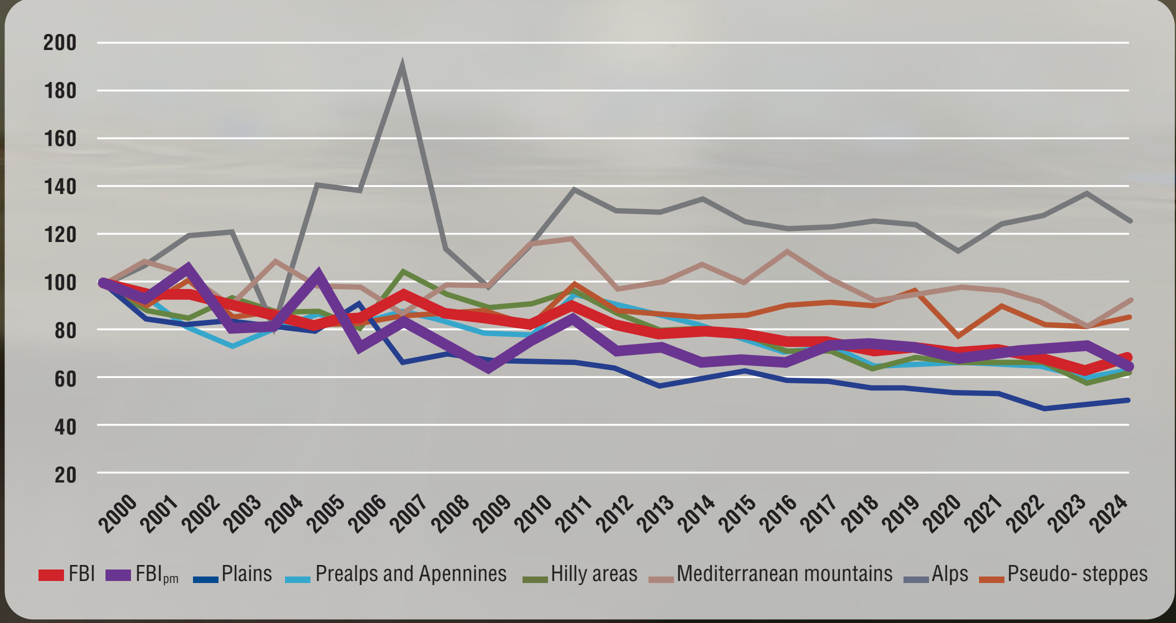
- 556 counters
- 1.903.641 bird records
- 1.773 squares (10x10 km)
- 177.472 listening points (1x1km)

2024

- 151 counters
- 106.071 bird records
- 651 squares (10x10 km)
- 9.601 listening points (1x1km)

National population trends provide a general overview of the situation in the country. However, calculating indices for bird zones also allows us to examine what is happening on a smaller scale, i.e. in very different homogeneous environmental situations (e.g. plains and mountains), which would not emerge with the analysis on a national scale alone. For each species, the trend within each ornithological zone was calculated, and subsequently, the FBI for that ornithological zone. It is extremely worrying that the impoverishment and degradation of the habitats of these target species is having a negative impact on both the lowland areas (-49.32%) and the Prealps and Apennines (-36.40%), as well as the hill areas (-37.23%), confirming how the simplification of farmland habitats and the massive use of chemicals has spread to a large part of the national territory. The data from the two-year period 2023-2024 also raise alarm bells about the effect climate change has on biodiversity the 2023 values in Mediterranean areas were particularly low probably also due to a rather dry season, a phenomenon that climate models predict as increasingly frequent.

In conclusion, it is imperative that urgent action is taken to reverse the ongoing trends, as outlined in the European Biodiversity Strategy 2030. It is evident that only through systemic action, consisting of changing the current model of agricultural and food policies, will it be possible to halt the loss of biodiversity.

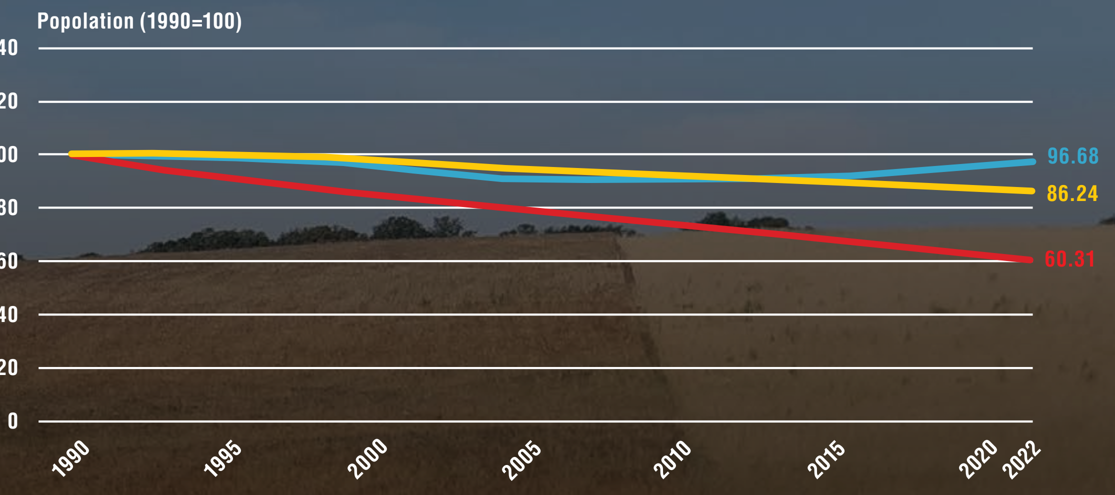


[1] Devictor V., Julliard R., Clavel J., Jiguet F., Lee A. & Couvet D. 2008. Functional biotic homogenization of bird communities in disturbed landscapes. *Glob. Ecol. Biogeogr.* 17 252-261.
[2] Filippi-Codaccioni O., Devictor V., Bas Y. & Julliard R. 2010. Toward more concern for specialisation and less for species diversity in conserving farmland biodiversity. *Biol. Conserv.*, 143, 1493–1500.
[3] Le Viol I., Jiguet F., Brotons L., Lindstrom S.H.A., Pearce-Higgins J.W., Reif J., et al. 2012. More and more generalists: two decades of changes in the European avifauna. *Biol Lett*, 8, 780–782.
[4] Londi G., Tellini Florenzano G., Campedelli T. & Fornasari L. 2010. An ornithological zonation of Italy. In: Bird Numbers 2010 *"Monitoring, indicators and targets". Book of abtsracts of the 18th Conference of the European Bird Census Council* (ed. Bermejo, A.). EBCC-SEO Birdlife, Madrid, Pp.77.

EBCC role

and the monitoring of bird populations at European level

The European Bird Census Council (EBCC) is a pan-European non-profit organisation dedicated to the monitoring and conservation of wild birds. Founded in the 1990s, it represents a network of experts, researchers and birdwatchers from all over Europe. The EBCC's primary objective is to collect reliable scientific data on the status and trends of bird populations, which are indispensable for both scientific projects and the development of environmental policies and conservation plans[1].
The EBCC coordinates two major projects on a large temporal and spatial scale, which are crucial for understanding bird population dynamics: the European Breeding Bird Atlas (EBBA) and the Pan-European Common Bird Monitoring Scheme (PECBMS).
The European Breeding Bird Atlas (EBBA) is regarded as one of the most ambitious endeavours in the realm of biodiversity mapping. The EBBA's primary objective is to comprehensively document the distribution and abundance of all bird species across the European continent. The first European Breeding Bird Atlas (EBBA1), the data collection of which commenced in the 1980s, was published in 1997, marking a significant milestone in the field of European ornithology and providing a foundational resource for conservation efforts. However, due to the sudden and significant changes in the landscape and climate on the continent, it became necessary to update these data slightly more than a decade later. A second atlas project, EBBA2, once again under the coordination of the EBCC, was initiated in 2010 and was published in 2020[2].
The Pan-European Common Bird Monitoring Scheme (PECBMS) is a transnational project that was initiated in 2002 with the goal of utilising common birds as indicators of the overall condition of ecosystems, by comparing changes in space and time in Europe's breeding populations.
Birds are regarded as 'ecological sentinels' due to their strong bond with the characteristics of their environment and their position in food chains, usually at the top. This means that fluctuations in their population sizes are an indicator of changes in their habitats.
The objective of the project is to collate monitoring data from all participating nations to generate comprehensive data on common bird species across Europe. This data is then integrated into a unified database, facilitating the production of indices and indicators of common birds also at the European level. The database is designed to be accessible to the scientific community, national and European policy-makers, and the general public interested in biodiversity conservation.
The data collected in Italy in the Farmland Bird Index project are submitted on an annual basis by the national coordinators to the European database, from which the European Environment Agency (EEA) draws for reports and monitoring purposes.
The calculation of the European common bird indicator (that is the European equivalent of the Italian Farmland Bird Index) is based on the populations of 39 species that are particularly dependent on the agricultural environment for both nesting and feeding, with rare species excluded from consideration. From this list, each country, as a baseline, selects the species for its national index[3].
The population indices are first calculated separately for each species on a national scale, thereby generating a national population index per species. Subsequently, to calculate the EU aggregate, the national species indices are combined into supranational indices. The process of combining the national indices into supranational indices involves the assignment of a weight to each national index, based on estimates of national population sizes. This weighting is intended to reflect the varying proportions of the European population of each species in each country. The resulting supranational indices for each species are then combined geometrically to obtain an aggregated multi-species European-wide index that represents the population trends of multiple species on a European scale. As with the Italian Farmland Bird Index, the European index is also expressed with respect to a base year, which in this case it is fixed to 1990 (although additional historical information dating back to the 1980s can be found on the EBCC website). The value of this year represents 100%, and the overall changes in populations are shown as trends over different periods.
Concurrently with the index of common farmland birds, two additional complementary indices have been developed to provide a more comprehensive overview: the index of all common birds (for which 168 species are considered) and the index of common forest birds (a total of 34 species). Further details on the methodology, species considered and reference data can be found on the EBCC website[1].
An analysis of the data collected from the 26 EU Member States demonstrates a strong decline in the indices between 1990 and 2022. The decline is not evenly distributed across different species groups; it is particularly pronounced for species typical of agricultural environments, which show a 40% reduction and are in decline in almost all countries on the continent (with the exception of a few countries in Eastern Europe for which data are only available from a more recent time period), while the indicator for all common birds and common forest birds show smaller decreases of close to 14% and 3%, respectively (Figure 1). It is important to note, however, that these analyses set 1990 as the base year. It is reasonable to assume that significant decreases had already occurred even before that date[4].
The most evident pressure factors, which are predominantly of anthropogenic origin, are as follows: agricultural intensification, changes in forest cover, urbanisation and changing temperatures in recent decades. However, on a European scale, there is significant heterogeneity between countries in the intensity and type of potential factors influencing bird population trends. For instance, the impact of agricultural intensification (in particular the negative impact of pesticide and fertiliser use) and urbanisation are more significant in Western European countries than in Eastern Europe (which until the beginning of the 21st century practised less intensive agriculture), just as temperature changes are more rapid in high-latitude regions.
The predominant impact of agriculture on biodiversity is evidenced by the alterations in the abundance and trends of bird species in Central and Eastern European countries, which have undergone a precipitous decline since their accession to the European Union and the Common Agricultural Policy. A scientific study published in 2024[5], draws the attention to the dramatic reality that, despite the great efforts of environmental legislation to develop and implement policies to protect biodiversity, the impacts of agricultural intensification (due to the availability of new European funds) have probably outweighed the possible benefits of conservation measures. However, it is noteworthy that for species covered by the Birds Directive, for which ad hoc actions have been implemented, population trends have been favourable, with increases being observed even in the newer member states. These findings suggest that supranational policy instruments can yield tangible conservation benefits.



Comparison of the three EU bird species indices for the period 1990-2022:

[1] EBCC: www.ebcc.info
[2] EBBA: https://ebba2.info
[3] PECBMS: https://pecbms.info
[4] Agenzia Europea dell'Ambiente: https://www.eea.europa.eu/en/analysis/indicators/common-bird-index-in-europe
[5] Reif J., Gamero A., Hološkova A., Aunins A., Chodkiewicz T., Hristov I., ... & Voršek, P. 2024. Accelerated farmland bird population declines in European countries after their recent EU accession. *Science of The Total Environment, 946*, 174281.
[6] Sanderson Fiona J., et al. 2016. "Assessing the performance of EUnature legislation in protecting target bird species in an era of climate change." *Conservation Letters* 9.3: 172-180.

Wheat fields by Federica Luoni

Population trend between **2000** and **2024**

The table on the following page shows population trends of common birds in Italy between 2000 and 2024; 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 2000-2024 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 upper 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*).

- *incerto* **?** 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 2000-2024 in which the species in question was recorded. This makes it possible to compare sample size between species. A total of 1.773 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 both at the national and international 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* (green)
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* (yellow)
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* (red)
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 that 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].

The **SPEC** column indicates the category assigned to each species according to the latest BirdLife International update. The categories assigned are:

- *SPEC 1* European species of global conservation concern;
- *SPEC 2* Species with global population concentrated in Europe and with unfavourable conservation status in Europe;
- *SPEC 3* Species not concentrated in Europe, but with unfavourable conservation status in Europe;
- *Non-SPEC^E* Species with global population concentrated in Europe and with favourable conservation status in Europe;
- *Non-SPEC* Species not concentrated in Europe, but with favourable conservation status in Europe.

For more information on the classification, see the relevant BirdLife publication[3].

It should be emphasized that the changes that lead a population to be placed in the various categories described above are to be understood from a statistical point of view and not in absolute terms. In some cases it may be the case that, from one year to the next, a species is classified with a different trend; this is because, with the addition of an annuality of data, a trend that was already in place in previous years but not so obvious as to be statistically significant may become apparent. If the added data contain a number of observations of a species, it is possible that their use will result in a change in the classification of the population trend (e.g., from moderate increase to strong increase) but this does not necessarily translate into an actual increase in the population and it follows that it does not necessarily stand for the fact that a particular species is recovering and enjoying a favorable conservation status

Western Yellow Wagtail by Fabio Fornasari

[1] Brambilla M., Gustin M., Celada C., 2013. Species appeal predicts conservation status. Biol. Conserv. 160, 209-213.
[2] Gustin 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.
[3] Burfield I.J., Rutheford C.A., Fernando E., Grice H., Piggott A., Martin R.W., Balman M., Evans M.I. & Staneva A. 2023. Birds in Europe 4: species of European Concern. Bird Conservation International.

Species name	Scientific name	Annual change ± SE (%)	Trend classification 2000-2024	Squares	Indicator	Conservation status	SPEC [1]
Barn Swallow	*Hirundo rustica*	-1.82 (±0.13)	Moderate decline	1273	FBI	Poor	SPEC 3
Black Redstart	*Phoenicurus ochruros*	1.47 (±0.23)	Moderate increase	597	FBI$_{pm}$	Favourable	Non-SPEC
Calandra Lark	*Melanocorypha calandra*	-2.22 (±0.82)	Moderate decline	79	FBI	Poor	SPEC 3
Carrion Crow	*Corvus corone*	-0.08 (±0.42)	Stable	227	FBI$_{pm}$	Favourable	Non-SPEC
Common Kestrel	*Falco tinnunculus*	-0.10 (±0.18)	Stable	1155	FBI	Favourable	SPEC 3
Common Nightingale	*Luscinia megarhynchos*	-0.41 (±0.11)	Moderate decline	1051	FBI	Favourable	Non-SPEC^{E}
Common Redpoll	*Acanthis flammea*	-5.55 (±0.70)	Moderate decline	91	FBI$_{pm}$	Favourable	Non-SPEC
Common Starling	*Sturnus vulgaris*	-0.58 (±0.18)	Moderate decline	915	FBI	Favourable	Non-SPEC
Corn Bunting	*Emberiza calandra*	0.28 (±0.15)	Stable	846	FBI	Inadequate	Non-SPEC^{E}
Crested Lark	*Galerida cristata*	-1.05 (±0.16)	Moderate decline	526	FBI	Inadequate	SPEC 3
Dunnock	*Prunella modularis*	-0.25 (±0.41)	Stable	185	FBI$_{pm}$	Favourable	SPEC 2
Eurasian Golden Oriole	*Oriolus oriolus*	1.84 (±0.16)	Moderate increase	893	FBI	Favourable	Non-SPEC
Eurasian Hoopoe	*Upupa epops*	-0.28 (±0.18)	Stable	890	FBI	Favourable	Non-SPEC
Eurasian Magpie	*Pica pica*	1.77 (±0.11)	Moderate increase	1072	FBI	Favourable	Non-SPEC
Eurasian Skylark	*Alauda arvensis*	-2,68 (±0.17)	Moderate decline	750	FBI	Poor	SPEC 3
Eurasian Tree Sparrow	*Passer montanus*	-2.95 (±0.18)	Moderate decline	1029	FBI	Poor	SPEC 3
Eurasian Wryneck	*Jynx torquilla*	-5.67 (±0.32)	Steep decline	625	FBI	Inadequate	Non-SPEC
European Goldfinch	*Carduelis carduelis*	-2.87 (±0.10)	Moderate decline	1325	FBI	Inadequate	Non-SPEC
European Greenfinch	*Chloris chloris*	-3.40 (±0.12)	Moderate decline	1219	FBI	Inadequate	Non-SPEC^{E}
European Serin	*Serinus serinus*	-0.97 (±0.10)	Moderate decline	1276	FBI	Favourable	Non-SPEC^{E}
European Stonechat	*Saxicola rubicola*	-5.81 (±0.19)	Steep decline	941	FBI	Inadequate	Non-SPEC
European Turtle Dove	*Streptopelia turtur*	-1.66 (±0.12)	Moderate decline	1035	FBI	Poor	SPEC 1
Fieldfare	*Turdus pilaris*	-1.96 (±0.66)	Moderate decline	105	FBI$_{pm}$	Inadequate	Non-SPEC^{E}
Garden Warbler	*Sylvia borin*	-5.34 (±0.75)	Moderate decline	105	FBI$_{pm}$	Inadequate	Non-SPEC^{E}
Greater Short-toed Lark	*Calandrella brachydactyla*	0.11 (±0.75)	Stable	146	FBI	Poor	SPEC 3
Hooded Crow	*Corvus cornix*	0.32 (±0.09)	Moderate increase	1244	FBI	Favourable	Non-SPEC
Italian Sparrow	*Passer italiae*	-2.97(±0.12)	Moderate decline	1153	FBI	Poor	SPEC 1
Lesser Whitethroat	*Curruca curruca*	0.20 (±0.65)	Stable	138	FBI$_{pm}$	Favourable	Non-SPEC
Northern Wheatear	*Oenanthe oenanthe*	-0.71 (±0.38)	Stable	224	FBI$_{pm}$	Poor	Non-SPEC
Ortolan Bunting	*Emberiza hortulana*	-2.57 (±0.79)	Moderate decline	113	FBI	Poor	SPEC 2
Red-backed Shrike	*Lanius collurio*	-3.97 (±0.22)	Moderate decline	831	FBI	Poor	Non-SPEC^{E}
Ring Ouzel	*Turdus torquatus*	-0.14 (±0.77)	Stable	101	FBI$_{pm}$	Inadequate	Non-SPEC^{E}
Spanish Sparrow	*Passer hispaniolensis*	-2.11 (±0.29)	Moderate decline	169	FBI	Inadequate	Non-SPEC
Spotless Starling	*Sturnus unicolor*	3.61 (±0.48)	Moderate increase	150	FBI	Favourable	Non-SPEC^{E}
Tawny Pipit	*Anthus campestris*	-3.44 (±0.46)	Moderate decline	237	FBI	Poor	Non-SPEC
Tree Pipit	*Anthus trivialis*	0.30 (±0.30)	Stable	299	FBI$_{pm}$	Inadequate	SPEC 3
Water Pipit	*Anthus spinoletta*	-1.13 (±0.39)	Moderate decline	141	FBI$_{pm}$	Inadequate	SPEC 3
Western Yellow Wagtail	*Motacilla flava*	-1.42 (±0.24)	Moderate decline	333	FBI	Inadequate	SPEC 3
Whinchat	*Saxicola rubetra*	-1.36 (±0.64)	Moderate decline	121	FBI$_{pm}$	Poor	Non-SPEC^{E}
White Wagtail	*Motacilla alba*	-1.37 (±0.17)	Moderate decline	1093	FBI	Inadequate	Non-SPEC
Yellowhammer	*Emberiza citrinella*	-2.92 (±0.42)	Moderate decline	230	FBI$_{pm}$	Poor	SPEC 2

MODERATE INCREASE ▲ · STRONG INCREASE ▲▲ · MODERATE DECLINE ▼ · STEEP DECLINE ▼▼ · STABLE ● · UNCERTAIN ? · FAVOURABLE (green) · POOR (red) · INADEGUATE (yellow)

For the nomenclature in the table and brochure texts, reference is made to the IOC world bird list https://www.worldbirdnames.org/new/ in continuity with previous years' publications.

[1]Burfield I.J., Rutheford C.A., Fernando E., Grice H., Piggott A., Martin R.W., Balman M., Evans M.I. & Staneva A. (2023). Birds in Europe 4: species of European Concern. Bird Conservation International.

Common Redpoll by Riccardo Bacchi

Nature Restoration Law:

an opportunity for all

Food production is considered to be one of the most significant human activities in terms of its direct interaction with and influence on natural ecosystems.
Indeed, agriculture is predicated on fundamental natural processes, including pollination and the formation of the soil. Consequently, agricultural practices can enhance or diminish the efficiency of these processes, thereby either reinforcing or compromising biodiversity, which underlies these very processes. Healthy and functioning ecosystems are therefore fundamental to food security, contributing significantly to the mitigation of and adaptation to climate change.

Nevertheless, the tendency exhibited by the Farmland Bird Index in this volume demonstrates an unstoppable degradation of biodiversity, as confirmed by data on a European scale[1], as well as by numerous scientific studies and reports. Notably, the European Environment Agency reports that two-thirds of the semi-natural habitats in the European Union depending on agricultural management that respects biodiversity are in a 'bad' conservation status[2].
The ongoing degradation of European nature has significant consequences for the capacity of ecosystems to support agriculture. In many cases, the demand for ecosystem services required to ensure food security has exceeded supply[4].
In consideration of the aforementioned factors, and the recognition of the necessity for a clearly defined strategy to ensure the successful restoration of biodiversity, whilst concurrently achieving efficient and resilient food production in support of food security, the European Commission has initiated the establishment of a significant measure for the conservation of European nature: the Nature Restoration Law.

Fallow area by Federica Luoni

The regulation was approved following a long process and entered into force on 18 August 2024. It constitutes a component of the "New Green Deal", a programme that the European Commission, under the leadership of Ursula Von der Leyen, promoted during the 2019-2024 legislative cycle to enact measures that would reverse the loss of biodiversity and counteract climate change.

The Nature Restoration Law consists of 28 articles, organised into six chapters, and a series of technical annexes for effective implementation.

One of the core objectives of the law, as delineated in Article 4, is the identification of targets for the restoration of habitats that are not currently in good conservation status with time slots set for 2030, 2040 and 2050.

In this regard, it is important to undeline that Annex I of the Habitats Directive enumerates 58 distinct habitat types, of which 23 are designated as 'agricultural semi-natural' due to their reliance on or association with extensive agricultural practices. Notably, more than a third of these (24) habitats are categorised as being entirely dependent on the preservation of suitable agricultural practices for their maintenance. Moreover, the regulation explicitly references the obligation to also act on the habitats of the species in the Annex if these are not in good conservation status.

The Nature Restoration Law does not, however, merely requires the restoration of directive habitats or of species habitats but addresses the decline in biodiversity also in a diffuse sense. Indeed, the restoration of agro-ecosystems, which are fundamental for the preservation of many bird species but not only, is also referred to in Articles 10 and 11.

Article 10, in particular, obliges Member States to promptly implement effective and appropriate measures to improve the diversity of pollinators and reverse the decline in their populations by 2030. It is evident that these actions will also have to cover the use of plant protection products, as stated in paragraph 5.

Article 11, first deleted by the vote of the Parliament and then reinstated during the during the trialogue, specifically calls on the Member Member States to implement restoration actions necessary to enhance the biodiversity of agricultural ecosystems through the 'implementation' of agro-ecological practices, some of which are listed examples in Annex VII. These include the introduction of characteristic landscape elements exhibiting high diversity in arable land and grassland formations that have been extensively exploited, the reduction of the intensity of pastures or grassland mowing regimes, the restoration where necessary of extensive grazing with domestic animals and extensive mowing regimes, but also the abandonment or reduction in the use of chemical pesticides and of chemical and animal manure fertilisers, the adoption of polyculture and crop rotation crop rotation.

It is evident that the aforementioned actions can be regarded as efficacious solutions for enhancing biodiversity, whilst concomitantly contributing to climate mitigation, adaptation, and pollution reduction, provided that they are adapted to local or regional socio-ecological circumstances. For instance, the implementation of crop rotation has been demonstrated to augment soil fertility and enhance crop health, thereby reducing the reliance on fertilisers and pesticides. A plethora of studies have demonstrated the economic viability and productivity-enhancing nature of these measures[5, 6, 7]. This principle is not limited to agricultural habitats; rather, it extends to the entire restoration programme, which is essential for maintaining the wide-ranging ecosystem services provided by biodiversity, such as water quality and the mitigation of the effects of extreme weather events, a frequency of which is anticipated to increase in response to climate change. Indeed, studies by the European Commission have calculated that habitat restoration can generate a gain of '4 to 38 euros in economic value for every euro spent'. This proves that restoration is an innovative and profitable economic investment, both in the present and the future.

The Nature Restoration Law is a comprehensive legislative instrument that aims to quantify the enhancement of biodiversity, with significant emphasis placed on the establishment of objectives and their subsequent monitoring (Article 20). In relation to the agricultural environments addressed by Article 11, the regulation mandates that Member States ensure the augmentation of at least two of the three parameters identified: the Butterfly Index, the Carbon Stock in soils, and the percentage of natural elements in the landscape. The Farmland Bird Index is identified as a key indicator within the context of agricultural environments, as outlined in Article 11(3). This provision stipulates that Member States shall endeavour to progressively enhance its value from 2025 (year 0) until 2050. The Nature Restoration Law places significant emphasis on the attainment of these targets and the subsequent monitoring of their progress (Article 20).

The responsibility for the implementation of the European regulation now lies with the individual Member States, including Italy. By September 2026, Italy will be required to prepare and submit a national implementation plan for the European regulation, which must be approved by the Commission. Although the time horizon appears to be distant at first glance, it is imperative to recognise that the timeframe for action is in fact quite limited. It is therefore essential to initiate action without delay if the ambitious targets set out in the regulation are to be met. Indeed, the urgent need to halt biodiversity loss and combat climate change is paramount if a prosperous future for our planet and its inhabitants is to be assured.

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Poppy by Giuseppe Magliani

Common Nightingale by Francesco De Palma