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2016

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, Sergio Frugis, Gaspare Guerrieri, Helmar Schenk and Giuseppe Tormen

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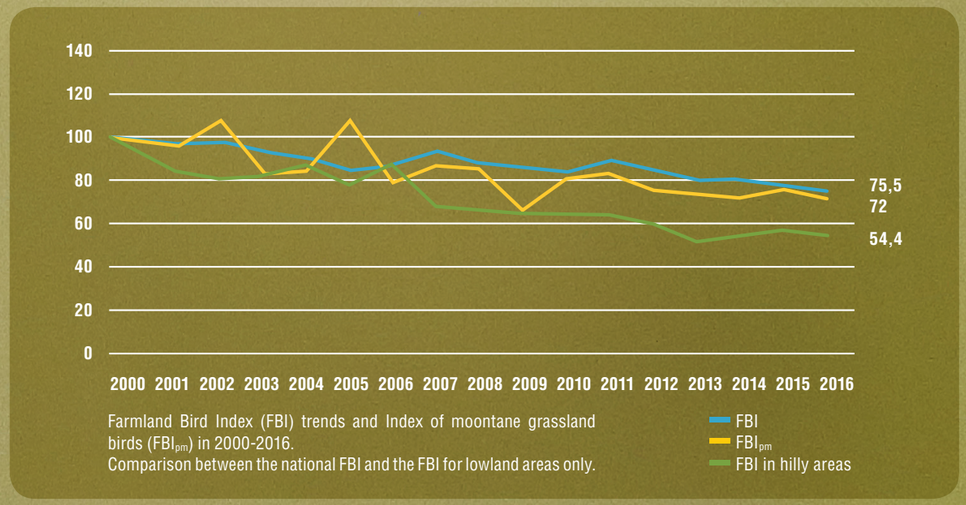
Cover photo
Crested lark by Simone Bottini

Lesser whitethroat by Carlo Cinthi

The **Farmland Bird Index**

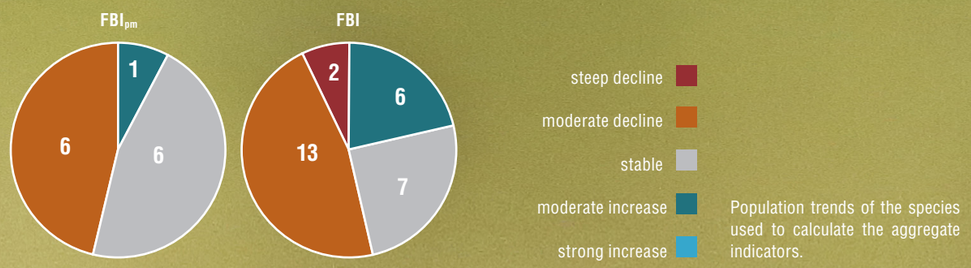
Farmland Bird Index trends continued to decline in 2016, with a loss of -24.5%.
For lowland areas only, the indicator for 2000-2016 is far worse that for Italy as a whole, with a value of 54.4 and a net loss of 45,6% in the population of the bird species used to calculate the FBI. This is probably due to the intensive farming model used in lowland areas, which takes space away from natural areas and uses environmentally-damaging substances.
The Index of montane grasslands birds (FBI_{pm}) also shows a decline (-28%), to a greater degree than the national Farmland Bird Index.
Of the 13 species used for this indicator, only one is increasing (Black Redstart), while about half are declining.
These results paint a worrying picture, caused by a concomitance of factors, including the climate crisis and the abandonment of local and traditional agriculture. While the former is difficult to tackle, at least in the short and middle term, the de-population of rural mountain areas could be stemmed by effective local policies, especially those related to rural development. The loss of small, traditional, family-owned farms, which often stand out in terms of the excellence of their products, is quickly leading to major and evident changes in the landscape, with the loss

Whinchat by Roberto Becucci



Farmland Bird Index (FBI) trends and Index of moontane grassland birds (FBI_{pm}) in 2000-2016.
Comparison between the national FBI and the FBI for lowland areas only.

of open areas such as meadows and pastures and their replacement by increasingly extensive woodlands. This translates both into a loss of the socio-cultural heritage tied to rural mountain traditions and a loss in biodiversity, habitat and nesting sites for the typical species of these environments. Such phenomena are taking place in much of the Apennines and in various parts of the Alps and Pre-Alps, especially away from major population centres.
On the other hands, many areas are experiencing an inverse process. Valley bottoms and areas that are well-exposed or accessible are experiencing rapid and drastic change in the other direction, with the unrelenting spread of increasingly specialized forms of agriculture, to the detriment of traditional crops and practices; one example is the replacement of farmland mosaics with permanent crops such as vineyards and orchards or the conversion of meadows into seed crops. More specifically, many meadows have been converted into orchards and vineyards, and those that remain are managed in a highly intensive manner, with a heavy input of nitrates, a simplification of the plant community, early and repeated mowing, and overgrazing; this is exactly the opposite of what is needed to maintain high levels of biodiversity and suitable conditions for birds.
These changes in farming practices in mountain areas are reflected in the population declines, at times quite evident, of bird species that nest and feed in grassland areas, such as shrikes, Yellowhammers, Skylarks, Stonechats and Whinchats.
Promoting the sustainable management of natural resources and providing greater and more effective support to small farms in mountain areas would help combat the climate crisis and maintain biodiversity in mountain areas. It would also provide an opportunity to support agricultural best practices (such as organic farming and extensive agriculture) and improve management in mountain areas, which are particularly at risk from erosion and environmental degradation.



Population trends of the species used to calculate the aggregate indicators.

The success of **generalist species**

Common starling by Roberto Becucci

The Farmland Bird Index is an aggregate indicator calculated as the geometrical average of the population indexes of 28 bird species. As it had in previous years, the indicator for 2000-2016 showed a clear decline, accounting for only 75.4% of its value in 2000 (100%). The decline in the FBI has gone hand-in-hand with the population indexes of individual species, 15 of which are declining, 7 stable and only 6 increasing.

Some of the species whose declines have been particularly serious include the Stonechat, Red-backed Shrike, Turtle Dove, and Wryneck, all of which live in diverse agricultural landscapes with hedgerows, tree-lines or patches of semi-natural habitats. Another group of species experiencing a population crisis are those of pseudo-Mediterranean steppes, arid grasslands typical of southern Italian regions, especially Apulia, Basilicata, Sicily and Sardinia. These species include Tawny Pipit, Calandra Lark and Crested Lark. The decline in the avifauna of these areas (and by extension, of their biodiversity as a whole), is undoubtedly tied to the reduction in agricultural habitat mosaics and non-intensive farmland. These habitats, which are often heterogeneous and of great importance for biodiversity, once took up much of the Italian agricultural landscape, but have now been reduced to small patches. The constant expansion of intensive agricultural on one hand and the abandonment of agriculture in mountain areas on the other led to a loss of habitat mosaics, which were replaced by monocultures in the former case and woodlands in the latter.

An analysis of the species that are increasing immediately shows that they all have one thing in common: they are generalists who are able to adapt to a wide variety of environmental conditions and to use varied resources depending on where they live. When environmental conditions change, they are able to adapt to the new situation, unlike other species that are specialized in a certain habitat. While man-made habitat changes lead to a loss in species diversity and an impoverished avifauna, certain opportunistic species are able to exploit the new conditions, as is the case with some corvids. The Hooded Crow and the Eurasian Magpie are two of the species that have seen the highest population increases. They are both omnivores, and eat fruit, insect, carrion, small reptiles, mammals, eggs, hatchlings and waste. Their intelligence and versatility allows them to adapt to various habitats and to take advantage of the abundance of resources made available by human activities, including waste, invertebrates that emerge after ploughing and mowing activities, and bird nests made more accessible by the great reduction in available hedgerows and shrubs.

The Eurasian Kestrel, the only diurnal raptor in the list of species used to calculate the FBI, is also increasing. A classic species of open landscapes, it forages and nests commonly on farmland, but is also found along woodland borders, in urban areas, alpine meadows and rocky cliffs. It uses a wide variety of nesting sites, cliffs, buildings (especially rural ones) or old crow nests in trees. It feeds mostly on large insects, lizards, rodents and small birds, depending on their availability. Its ability to adapt to a great many different habitats is what makes it so widespread, and it is not surprising that its population trends are more favourable than those of more specialized species; indeed, it has shown a slight increase during the survey period.

The other species that are increasing are the Spotless Starling, Golden Oriole and Corn Bunting. Although these species all live in different habitats and have different diets, all three are highly adaptable to changing conditions. The omnivorous Spotted Starling is found in various types of rural and urban habitats, since it can nest in cavities in buildings, posts, roofs and trees. The insect-eating Golden Oriole lives in oak forests and riparian woodlands, but also does well in secondary forests that have taken over abandoned farmland and in industrial poplar plantations. The seed-eating Corn Bunting (which however feeds its young on insects) is found in open or semi-open grassy habitats: pseudo-steppes and semi-natural grasslands, pastures, hay meadows, alfalfa crops, cereal crops and fallow areas with a limited presence of trees and bushes.

The fact that the species that are increasing are all generalists is further confirmation of a well-known phenomenon that has been ongoing for quite some time, both in agricultural areas and elsewhere: as the human impact on the environment becomes increasingly evident, the only species that can successfully adapt to these changing conditions are the most versatile and least demanding ones. Some, such as corvids, are able to successfully exploit the resources that intensive agriculture makes temporarily available; others, such as the Kestrels, thrive thanks to their ecological plasticity. On the other hand, more demanding species, which include most of those of conservation interest and those strongly tied to agricultural habitats, continue to suffer drastically from recent changes in farming practices.

Population trends between **2000** and **2016**

The table on the following page shows population trends of common birds in Italy between 2000 and 2016; these are the species used to calculate the Farmland Bird Index (FBI) and 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 2000-2016 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*).
- *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 2000-2016 in which the species in question was recorded. This makes it possible to compare sample size between species. A total of 1.185 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:
- species 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 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].
Finally, the **Red List** columns indicates the threat status for every species in the 2011 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 publication[3].

European greenfinch by Marco Mattei

[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] Peronace, V., Cecere, J.G., Gustin, M., Rondinini, C., 2012. Lista Rossa 2011 degli Uccelli Nidificanti in Italia. Avocetta 36: 11-58

Species name	Scientific name	Annual change ± SE (%)	Trend classification 2000-2016	Squares	Indicator	Conservation status	Red List
Barn Swallow	*Hirundo rustica*	-1.20 (±0.22)	▼	1076	FBI		NT
Black Redstart	*Phoenicurus ochruros*	1.78 (±0.39)	▲	500	FBI_{pm}		LC
Calandra Lark	*Melanocorypha calandra*	-2.87 (±1.11)	▼	533*	FBI		VU
Carrion Crow	*Corvus corone*	-1.57 (±0.74)	●	183	FBI_{pm}		LC
Common Kestrel	*Falco tinnunculus*	1.03 (±0.30)	▲	982	FBI		LC
Common Nightingale	*Luscinia megarhynchos*	0.26 (±0.18)	●	886	FBI		LC
Common Redpoll	*Acanthis flammea*	-6.07 (±1.17)	▼	84	FBI_{pm}		LC
Common Starling	*Sturnus vulgaris*	0.48 (±0.30)	●	748	FBI		LC
Corn Bunting	*Emberiza calandra*	1.61 (±0.26)	▲	720	FBI		LC
Crested Lark	*Galerida cristata*	-1.34 (±0.27)	▼	447	FBI		LC
Dunnock	*Prunella modularis*	-0.66 (±0.60)	●	176	FBI_{pm}		LC
Eurasian Golden Oriole	*Oriolus oriolus*	3.28 (±0.27)	▲	728	FBI		LC
Eurasian Hoopoe	*Upupa epops*	-0.46 (±0.32)	●	728	FBI		LC
Eurasian Magpie	*Pica pica*	2.16 (±0.18)	▲	890	FBI		LC
Eurasian Skylark	*Alauda arvensis*	-4.23 (±0.28)	▼	656	FBI		VU
Eurasian Tree Sparrow	*Passer montanus*	-2.75 (±0.30)	▼	852	FBI		VU
Eurasian Wryneck	*Jynx torquilla*	-6.04 (±0.52)	▼▼	482	FBI		EN
European Goldfinch	*Carduelis carduelis*	-2.83 (±0.17)	▼	1141	FBI		NT
European Greenfinch	*Chloris chloris*	-3.37(±0.20)	▼	1039	FBI		NT
European Serin	*Serinus serinus*	-0.09 (±0.17)	●	1086	FBI		LC
European Stonechat	*Saxicola rubicola*	-5.66 (±0.31)	▼▼	808	FBI		VU
European Turtle Dove	*Streptopelia turtur*	-0.55 (±0.21)	▼	880	FBI		LC
Fieldfare	*Turdus pilaris*	-4.59 (±0.84)	▼	94	FBI_{pm}		NT
Garden Warbler	*Sylvia borin*	-7.45 (±1.31)	▼	91	FBI_{pm}		LC
Greater Short-toed Lark	*Calandrella brachydactyla*	-2.06 (±0.97)	▼	122	FBI		EN
Hooded Crow	*Corvus cornix*	1.39 (±0.17)	▲	1061	FBI		LC
Italian Sparrow	*Passer italiae*	-3.89 (±0.21)	▼	984	FBI		VU
Lesser Whitethroat	*Sylvia curruca*	1.58 (±0.99)	●	121	FBI_{pm}		LC
Northern Wheatear	*Oenanthe oenanthe*	-0.35 (±0.59)	●	211	FBI_{pm}		NT
Ortolan Bunting	*Emberiza hortulana*	-0,12 (±1.19)	●	104	FBI		DD
Red-backed Shrike	*Lanius collurio*	-4.36 (±0.36)	▼	700	FBI		VU
Ring Ouzel	*Turdus torquatus*	-0.51 (±1.15)	●	99	FBI_{pm}		LC
Spanish Sparrow	*Passer hispaniolensis*	-4.12 (±0.48)	▼	156	FBI		VU
Spotless Starling	*Sturnus unicolor*	4.67 (±0.69)	▲	142	FBI		LC
Tawny Pipit	*Anthus campestris*	-3.61 (±0.78)	▼	207	FBI		LC
Tree Pipit	*Anthus trivialis*	-0.51 (±0.50)	●	273	FBI_{pm}		VU
Water Pipit	*Anthus spinoletta*	-1.50 (±0.58)	▼	140	FBI_{pm}		LC
Western Yellow Wagtail	*Motacilla flava*	-2.91 (±0.43)	▼	255	FBI		VU
Whinchat	*Saxicola rubetra*	-4.04 (±1.04)	▼	117	FBI_{pm}		LC
White Wagtail	*Motacilla alba*	-0.13 (±0.29)	●	916	FBI		LC
Yellowhammer	*Emberiza citrinella*	-3.24 (±0.67)	▼	208	FBI_{pm}		LC

* number of points, not squares (population index calculated with point method)

MODERATE INCREASE ▲ | STRONG INCREASE ▲▲ | MODERATE DECLINE ▼ | STEEP DECLINE ▼▼ | STABLE ● | UNCERTAIN ? | FAVOURABLE | POOR | INADEQUATE

Common vetch by Caterina Mattana

Birds and the cap:

alpine meadows

and a present that is anything but green

Let us imagine the Alps of decades past… we would only need to travel back to the 1950s to see a profoundly different environment: mountain areas were populated and farmed and forests were much less extensive and more intensively exploited for firewood, coal, and timber. Extensive areas were kept open by family-run farms (especially near settlement) and livestock raising, with cropland at lower elevations, permanent meadows on steep slopes, and pastures in the higher areas.

Until that point, agriculture had been practiced in an extensive manner and for subsistence purposes, with minimal external inputs and no mechanization. As it slowly evolved, it profoundly transformed the landscape, yet left ample room for nature. The changes in agricultural practices that took place between the mid 20th century and the present have been far more drastic than the previous changes that took place over millennia, beginning with the Neolithic origins of agriculture. These changes had major consequences for the Alpine economy and society, as well as on the environment and biodiversity. The centuries-old history of interactions between farming and the environment has created such an inextricable link that many European plant and animal species depend almost entirely on agricultural ecosystems, and many of them have entered into a crisis with the drastic changes of the modern era.

In Trentino, as is the case elsewhere in the Alps, the livestock sector and its associated pastures, one of the most important sectors for the Alpine farming and economic system, has undergone profound changes over the last 40 years. Subsistence livestock farming, based on small, family-run livestock farms widely scattered over the entire territory gradually gave way to market-oriented livestock farming, with fewer but much larger farms specialized in producing milk. At the same time, less accessible areas where mechanization was difficult (distant from farm headquarters, at high elevations, or on steep slopes) were gradually abandoned and taken over by woodlands. Intensive livestock farming has led to the abandonment of high-elevation summer pastures, especially for dairy cows, whose diet now features energy-rich supplementary

foods. Smaller breeds that were well-suited to the harsh Alpine environment were gradually replaced by more productive breeds raised at high population densities, and thus producing more waste. This waste is generally used on the farm's meadows and pastures as manure, especially in valley bottoms and relatively flat areas that are accessible for farm machinery. In such areas, the intensive use of fertilizers in mesic meadows and grasslands initially increased their productivity, making it possible to mow them earlier and more often, but in the long term it led to eutrophication, with a negative impact on their plant life and on their agricultural and environmental value. The weeding, over-seeding, or re-seeding of unproductive meadows with grass species alien to the local area has led to their further floristic impoverishment, especially in Alpine valley bottoms. **In the space of a few years, Alpine meadows have been radically transformed, with the loss of most species-rich permanent meadows (with their spectacular wildflowers), now replaced by woodlands or species-poor grasslands dominated by a handful of species of low floristic or grazing interest. These changes trigger trophic cascades affecting invertebrates and vertebrates.**

An awareness of these negative developments, which have affected in a similar manner most European secondary grasslands, have led the last reform of the Common Agricultural Policy (CAP), which in 2022 will give way to new regulations, to include among the obligations of greening (the environmental share of payments under the first pillar) a commitment to preserve permanent meadows. However, this obligation does not seem to have translated into an actual improvement of the situation. In the vast majority of places there is no absolute obligation to maintain these meadows (the substitution of a certain share is allowed, and there are no distinctions between the various types of meadows), and there are no norms regulating meadow management that can contain intensification and as a result, the degradation of grassland areas.

Some of the most typical wildlife of permanent Alpine meadows includes numerous birds that remained relatively widespread until the 1990s: Common Quail, Corn Crake, Skylark, Tree Pipit, Whinchat, Barred Warbler, Red-backed Shrike and Yellowhammer. Given the recent history of these meadows, it is no surprise that all of these species now face an unfavourable conservation status, both in Italy and in Europe as a while. The effects of the changes that so drastically affected permanent meadows on their bird communities was one of the research questions tackled by a study conducted by the Vertebrate Zoology Department of the Trento Museum of Science (MUSE).

To this end, the study looked at montane agricultural grassland landscapes at low and mid elevations in Trentino. These landscapes are increasingly rare, as evidenced by the fact that their surface area was nearly cut in half between 1990 and 2010 due to abandonment and, more importantly, conversion to other crops, particularly orchards and vineyards. Birds were used as biological indicators in this environment.

The study found that landscapes with a high percentage of former meadows recently converted to other crops hosted a bird community dominated by generalist species, which replaced grassland specialists. Where permanent meadows remain, many species are influenced by the mowing schedule: if mowing takes place before June 20, the breeding success of species breeding in grasslands is reduced, thus making the meadows inhospitable for them. One example is the Whinchat, a small migratory songbird that disappeared from nearly all meadow areas under 900 meters elevation – where it had been regular until only 30-40 years ago – as a result of mechanized mowing taking place earlier than it used to. The same fate seems to be awaiting the Corn Crake, whose population has been declining steadily throughout Trentino, as shown by surveys that have been taking place since the mid-1990s.

An earlier mowing schedule, which coincides with the most delicate phase of the nesting period for grassland birds, is often brought about by over-fertilization, which also causes an impoverishment in the flora and invertebrate fauna of eutrophicated meadows. This in turn has more negative effect on birds, including non-specialist species that forage in these habitats.

The intensification of grassland agriculture also leads to the removal of typical elements of extensive agricultural landscapes, such as hedgerows and shrubs. In order to facilitate mowing and fertilizing operations on extensive surfaces using heavy machinery, these elements are removed, and the species that use them to nest disappear with them. Two such species, the Red-backed Shrike and the rare Barred Warbler, are of great conservation interest.

Modern agricultural practices and livestock farming in mountain areas have thus lost much of their former, profound links with traditional landscapes, and with the wealth of flora and fauna that inhabited cultivated areas and pastures in the past. These negative effects are the consequence of economic and social changes that affected the Alps over the last few decades, and which were sometimes exacerbated or sped up by the CAP.

The current CAP rules that attempted to stem these declines did not achieve the hoped-for results. The regulations currently under discussion for the next planning period reiterate the obligations included in the current planning period, and they **introduce the eco-scheme tool, a per-hectare payment (under the first pillar) for farmers who implement good management practices for the environment and the climate. This tool could help promote sustainable meadow management, by linking the amount of the payment to the natural value of the meadow itself.** This decision is in the hands of the individual Member States, who will have to identify the necessary interventions in their own National Strategic Plan, and of the regions, who will draft their own Rural Development Programmes in keeping with the guidelines of their National Strategic Plan.

In order to improve the management of mountain areas, it would also be important to protect and support sustainable micro-economies, based on high-added-value local dairy products closely linked to the traditional landscapes they are rooted in and that contribute to their identity. These value chains can have great importance for other strategic sectors as well, such as tourism, and indirectly for local biodiversity and environmental quality. Strategies that promote sustainable products strongly identified with the local area, which positive repercussions on the local landscape and the species it hosts, should become one of the cornerstones of land management planning in mountain areas in Italy.

For more information:

Assandri G., Bogliani G., Pedrini P. & Brambilla M. (2019). Toward the next Common Agricultural Policy reform: determinants of avian communities in hay meadows reveal current policy's inadequacy for biodiversity conservation in grassland ecosystems Journal of Applied Ecology 56, 604-617.

Assandri G., Bogliani G., Pedrini P. & Brambilla M. (2019). Species-specific responses to habitat and livestock management call for carefully targeted conservation strategies for declining meadow birds. Journal for Nature Conservation, 125757.

Tree pipit by Maurizio Rizzi

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