

Report: Butterflies across the EU are in decline

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According to the analysis of the scientists, the orange tip (*Anthocharis cardamines*) is the only butterfly species in Europe for which a significant increase can be recorded. Credit: Ulrike Schäfer

The diagnosis sounds worrying: More than 80% of habitats in the EU are

currently considered vulnerable. This has negative consequences on their functional capability and thus the services they provide for humans. In order to counter this, the European Commission has proposed a new set of rules.

This "Nature Restoration Law" is one of the key elements of the EU Biodiversity Strategy 2030 to be published this May. It defines binding targets for the entire EU for the renaturation of various ecosystems. Two years after the regulation enters into force, member states must submit plans on how they intend to meet these targets. They must also document the success of their measures.

However, the latter is not so easy. So far, there are only a few indicators that can reliably show the state of biodiversity. For most animal and plant groups, there is a lack of comparable data across Europe from which to assess the development of populations. The few exceptions include birds, bats, and butterflies.

"Butterflies in particular are ideal bioindicators," says agricultural ecologist Prof. Dr. Josef Settele from the UFZ. This is because these insects occur in a wide range of habitats and react sensitively to environmental changes. With their specific requirements, they are often representative of many other insects. Finally, they are eye-catching, attractive, and popular. It is thus relatively easy to motivate volunteers to take part in scientifically oriented butterfly counts.

Such actions are becoming increasingly popular. For example, in 2005 the UFZ and the Gesellschaft für Schmetterlingsschutz (GfS) launched a [citizen science project](#) called "Tagfaltermonitoring Deutschland" (Butterfly Monitoring Germany) in which anyone interested can participate.

Since then, butterfly enthusiasts from all over Germany have been

walking fixed routes from spring to autumn to record the number of individuals and [species](#) they have seen. Similar monitoring programs now exist in most other European countries. "Around 5,000 volunteers spread all over Europe are now taking part—all following the same protocol," says Settele.

The data are collected and analyzed in the central "European Butterfly Monitoring Scheme" (eBMS) database, managed by UKCEH and mirrored at UFZ and the Dutch "Vlinderstichting." In this way, the population development of individual species can then be tracked. Common trends for the inhabitants of certain habitats can also be identified.

This is precisely the idea behind the Butterfly Grassland Indicator, which is based on the population trends of 17 typical species of meadows and pastures. If the positive and negative trends in these species roughly balance each other out, the indicator remains at the same level. If more species decline than increase in the same period, the value decreases—and vice versa. Lower values thus indicate greater problems among grassland dwellers.

The latest results of these calculations, which include data from 1990 to 2020, therefore do not bode well.

The analysis, which was also co-financed by the EU project SPRING (Strengthening Pollinator Recovery through Indicators and monitoring) coordinated by the UFZ, shows only one winner: In the 27 member states of the EU, only the Orange Tip (*Anthocharis cardamines*) displayed a moderate increase. Three species are stable: the Large Skipper (*Ochlodes sylvanus*), the Common Copper (*Lycaena phlaeas*), and the Meadow Brown (*Maniola jurtina*).

Five species—from the Common Blue (*Polyommatus icarus*) to the Wall

Brown (*Lasiommata megera*)—are showing declining populations. "The biggest loser in recent years has been the large blue (*Phengaris arion*), which for example has disappeared completely in the Netherlands," says Settele. For the remaining species of the 17 grassland inhabitants studied, there is either no clear trend or too little data.

The picture becomes even less favorable if we look not only at the EU but rather at Europe as a whole. Then there are no species on the rise and only three are stable. Six show a moderate and one even a strong decline.

In view of these developments, it is not surprising that the grassland indicator is now at a considerably lower level than before. In the last 10 years alone, the calculated value for the EU has fallen by 32%—and that for Europe as a whole by as much as 36%. The crisis of the grassland dwellers has apparently already taken hold of the entire continent.

This is becoming increasingly more evident the more information is provided by the volunteer butterfly counters from different countries. "The declines are not confined to north-western Europe," says Chris van Swaay of Butterfly Conservation Europe. "However, some species in the South and East are doing much better."

He and his colleagues attribute the dwindling butterfly occurrences mainly to changes in agriculture. In north-western Europe, for example, the over-intensive use of meadows and pastures has a particularly unfavorable effect. The heavy use of fertilizers often also pollutes adjacent protected areas with excessive amounts of nitrogen. In the rest of Europe, the main problem is the complete abandonment of cultivation. That's because grassland butterflies also cope poorly with this.

According to the experts, a large set of measures is necessary in order to save them. It is important to promote the sustainable use of meadows

and pastures, to create new valuable habitats, and to better connect the existing ones. And most grassland butterflies would also benefit from effective climate change mitigation.

"Despite all efforts, these insects are still declining in many parts of Europe," says van Swaay. "We hope that the upcoming Nature Restoration Law can stop this decline so that our children can also enjoy butterflies in flower-rich grasslands."

More information: Report: [assets.vlinderstichting.nl/doc ...
7df-9b954d511cfa.pdf](https://assets.vlinderstichting.nl/doc/7df-9b954d511cfa.pdf)

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