

Butterfly numbers down by two-thirds—scientists call for a change in agricultural approaches

March 19 2019



Weaver's Fritillary (*Boloria dia*), also known as the Violet Fritillary, is restricted to near-natural dry grasslands; it is therefore threatened by agricultural intensification. Credit: Senckenberg/Schmitt

Together with a German/Polish team, Senckenberg scientist Thomas Schmitt studied the effects of various land use models on the butterfly fauna. The researchers show that meadows adjacent to high-intensity agricultural areas are home to less than half the number of butterfly species than areas in nature preserves. The number of individuals is even down to one-third of that number. In their study, which was recently published in the scientific journal *Insect Conservation and Diversity*, the scientists emphasize the need for a more environmentally friendly agriculture.

Germany is home to roughly 33,500 [species](#) of insects – but their numbers are decreasing dramatically. Of the 189 species of butterflies currently known from Germany, 99 species are on the Red List, 5 have already become extinct, and 12 additional species are threatened with extinction. "We assume that this negative trend is primarily due to the industrialization of agriculture," explains Prof. Dr. Thomas Schmitt, the director of the Senckenberg German Entomological Institute in Müncheberg, Brandenburg, and he continues, "In our new study, we examined the specific effects of the intensity of agricultural use on the butterfly fauna."

To this end, the research team around Schmitt recorded the occurrence of butterfly species in 21 meadow sites east of Munich. Of these study sites, 17 are surrounded by agriculturally used areas, and 4 are in [nature preserves](#) with near-natural cultivation. "Our results show an obvious trend: in the vicinity of intensively cultivated fields that are regularly sprayed with pesticides, the diversity and numbers of butterflies are significantly lower than in meadows near less used or unused areas," explains the study's lead author, Prof. Dr. Jan Christian Habel of the Technical University in Munich.



The Pearly Heath (*Coenonympha arcania*) requires a richly structured cultural landscape with hedgerows and other structural elements. Therefore, it is among the declining butterfly species. Credit: Senckenberg/Schmitt

The entomologists recorded a total of 24 butterfly species and 864 individuals in all study sites. "In the meadows that are surrounded by agriculturally used areas we encountered an average of 2.7 butterfly species per visit; in the four study sites within the nature preserves 'Dietersheimer Brenne' and 'Garchinger Heide' we found an average of 6.6 species," adds Prof. Dr. Werner Ulrich of the Copernicus University in Thorn, Poland. Specialists among the butterflies were particularly dependent on near-natural habitats, while the more adaptable

"generalists" were also found in other grassland sites.

"Our study emphasizes the negative impact of the conventional, industrialized agriculture on the butterfly diversity and shows the urgent need for ecologically sustainable cultivation methods. Additional field studies may aid in identifying individual factors responsible for the insect die-back and in implementing appropriate countermeasures," adds Schmitt in closing.

More information: Jan Christian Habel et al. Agricultural intensification drives butterfly decline, *Insect Conservation and Diversity* (2019). [DOI: 10.1111/icad.12343](https://doi.org/10.1111/icad.12343)

Provided by Senckenberg Research Institute and Natural History Museum

Citation: Butterfly numbers down by two-thirds—scientists call for a change in agricultural approaches (2019, March 19) retrieved 22 June 2024 from <https://phys.org/news/2019-03-butterfly-two-thirdsscientists-agricultural-approaches.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.