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Silent summer?

Biodiversity loss, insect decline, and a call for conservation

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Sixty years ago, Rachel Carson's book, *Silent Spring*¹, alerted the public's attention to devastating consequences of the use, and over use, of pesticides. Carson's book not only caught the public's attention leading to a cultural transformation, but also instigated the worldwide environmental movement, creation of legislation, and the founding of regulatory agencies in many countries. This is much like the "Krefeld study"², which could be considered a modern successor of Carson's book. In this case, it raised public awareness to the issue of insect decline and quickly led to political discussions at various levels, legislative changes, and initiatives for conservation by the general public, which occurred only months after its publication.

Despite both of these works having spurred societal change, they have had limited impact for comprehensive conservation that reverses biodiversity loss. To this day, biodiversity loss remains one of the top five long-term global risks. The main threats are habitat loss due to changes in land use and an intensification in agriculture, an increase in the use of pesticides and fertilizers, as well as an expansion of invasive alien species. The creation of the *EU Biodiversity Strategy to 2020*³ was intended to prioritize biodiversity in EU policies and several measures were started within the framework of existing policies and legislation.⁴ Most of these measures focused on creating or providing habitats for insects or controlling invasive species. However, to maintain and restore endangered populations, we must diversify our agricultural and cultivated landscapes and reduce pesticides and biocides.⁵

In an assessment of the EU initiatives, it was found that they are not effective in stopping pollinator decline.⁶ In order to bring about transformative policies, three changes are necessary: 1. measures that are directed towards specific threats for specific groups (i. e., bees, hoverflies) are needed, along with the creation of long-term monitoring programs for biodiversity and drivers that influence it; 2. current measures must be evaluated, and successful ones integrated into EU policy instruments; and 3. the protection of wild insects should be implemented into the pesticide risk assessment process. Currently, there is a lack of consistent approaches in protecting wild pollinators and there are gaps in the policies addressing the main threats to beneficial insects. Changes are under way through initiatives such as the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) or *Faktencheck Artenvielfalt*⁷ in Germany, which are synthesizing the data we have in order to help close these knowledge gaps and develop appropriate recommendations for action.

Yet there is still a considerable amount of work left. In the sixty years since the publication of *Silent Spring*, the created policies have not been successful in reversing biodiversity loss. However, the effective implementation of the aforementioned changes as well as joint transdisciplinary knowledge production by science, policy, and practice to bring forward conservation could be the start in preventing its sequel, the "silent summer".

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1 Carson, R. 1962. *Silent spring*. Boston: Houghton Mifflin.

2 Hallmann, C.A. et al. 2017. More than 75 percent decline over 27 years in total flying insect biomass in protected areas. *PLOS ONE* 12/10: e0185809. <https://doi.org/10.1371/journal.pone.0185809>.

3 https://ec.europa.eu/environment/nature/biodiversity/strategy_2020/index_en.htm

4 E.g., the *EU Pollinators Initiative*, the *Programme for Environment and Climate Action (LIFE)*, the *Habitats Directive*, the *Natura 2000 network*.

5 Nationale Akademie der Wissenschaften Leopoldina, acatech – Deutsche Akademie der Technikwissenschaften, Union der deutschen Akademien der Wissenschaften.

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6 European Court of Auditors. 2020. *Protection of wild pollinators in the EU. Commission initiatives have not borne fruit*. Special report 15/2020.

www.eca.europa.eu/Lists/ECADocuments/SR20_15/SR_Pollinators_EN.pdf.

7 www.feda.bio/de/faktencheck-artenvielfalt