

# THE STATE OF GLOBAL INSECT DECLINE

By Dr Philip Donkersley, Lancaster University

The past 30 years of international politics has produced over 30 reports, reviews and treaties to [prevent biodiversity loss](#). None of these efforts has actually managed to reverse biodiversity loss trends or meaningfully change how we are exploiting the planet. We know [insects are declining](#) in abundance, diversity, and biomass globally.

The plethora of factors threatening insect abundance and species richness are largely well understood and [documented](#): land-use change (especially habitat destruction), climate change, deforestation and habitat degradation. Insects are challenged by additive stressors, such as insecticides, herbicides, urbanization, and light pollution. Ultimately, these drivers largely stem from economic overexploitation.

[Agricultural intensification](#) – based on massive scale monoculture, fertiliser overuse, pesticide applications and destruction of native habitats for insects in and around farmland – is being pursued with the aim of increasing productivity. Pesticide use comes with problems. From an efficacy perspective, they are prone to self-obsolence as insect resistance evolves. In environmental terms, systemic, broad range formulations in particular can have deleterious effects, through non-target effects and synergistic effects of multiple pesticides. Run-off from agricultural systems is causing widespread issues in aquatic habitats and the common cattle worm treatment, [ivermectin](#), is damaging dung insect communities. An ever-increasing land area is being exposed to chemical pesticides and application volumes are up.

Since 2005, global pesticide use has more than doubled. In the UK, pesticide applications have decreased in on-site concentrations, but the area of land sprayed has outstripped this reduction.

One class of pesticides now severely restricted in the EU (though notably free to use elsewhere) provides a case in point: neonicotinoids. Widely applied until their prohibition in 2018, they have gained notoriety for their toxicity to bee and butterfly species. Despite improvements in detecting small quantities of these chemicals, uncertainty remains around rates of bioaccumulation and the relationship between detection and toxicity. In spite of the EU moratorium, neonicotinoids remain the most widely used insecticides globally.



Despite our ever-increasing [knowledge around historic failures](#) to account for the unintended consequences of chemical pesticides, no effective change to risk assessment policy has emerged. Legislative changes have however placed increasing emphasis on research and development of integrated pest management approaches. Biocontrol and the mass release of natural enemies, has seen an uptick in the number of approved biopesticides available. Biopesticide development also stems from knowledge relating to existing biodiversity, including insects and naturally occurring insecticides.

The picture is complex and agrochemicals interact with other drivers to effect insect decline across multiple scales. An increased focus on management for complexity and exploitation of natural biological control measures represents an important middle ground that is central to wider plans for ensuring both sustainable food production and supporting natural insect populations.

Increasing society's knowledge about insects helps people to understand the tremendous importance of preserving insect populations. Arguably, the widespread perception of insects as "creepy crawlies" is one of the main blocks

to coherent policy for insects (beyond policies for bees). There is an important role for entomologists to reach out and connect through education programs at schools and in wider society.

We have seen the fossil fuel and agrochemical industries abuse public confidence in research due to exaggerated or poorly conducted studies. Entomologists should proactively and publicly address government sluggishness.

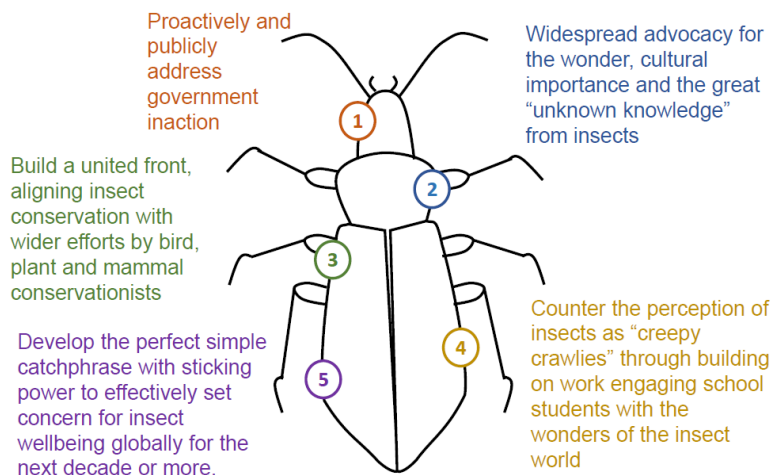
The politics are complicated: there is considerable political will to place people, businesses, economy, status of living, and social justice matters ahead of nature's needs. This is linked inextricably with ongoing biodiversity loss:

interventions that solely target damaging human activities without making efforts to restore their environment. We need to present a united front, aligning insect conservation with wider efforts by bird, plant and mammal conservationists to show clear interdependencies between ecological fields and consequential benefits.

Further reading - [Global insect decline is the result of wilful political failure: A battle plan for entomology.](#)

### A battle plan for Entomology

Philip Donkersley, Louise Ashton, Greg P. A. Lamarre, Simon Segar (2022)



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