



## The grim facts

Only now are global declines in insects attracting interest from scientists. This is especially since the publication of a research paper in October 2017 which confirmed the results of a survey of insect populations in Germany. The team used Malaise Traps to measure the total insect biomass of over 63 nature reserves across the country. Their conclusions are shocking!<sup>2</sup>



"Our analysis estimates a seasonal decline of 76%...in flying insect biomass over the 27 years of study."<sup>2</sup>

And even worse the study found a more severe decline of 82% in mid-summer. The researchers suggest this major decline in aerial insect biomass was probably not due to habitat loss and climate change - rather that the plausible explanations may be agricultural intensification including pesticide use, year-round tillage and the increased use of fertilisers.<sup>2</sup>

"Whatever the cause...for the decline, they have a far more devastating effect on total insect biomass than has been appreciated previously."<sup>2</sup>

These results illustrate an ongoing and rapid decline populations of airborne insects and highlights a crisis in insect numbers that could have significant consequences.<sup>2</sup> Of more concern is the fact that such catastrophic declines occurred in nature reserves - areas that should provide refuge for insects. We can only speculate about conditions across the majority of the landscape which suffers under intense agricultural production and today supports virtually no insect life.<sup>3</sup>

"There has been some kind of horrific decline...we appear to be making vast tracks of land inhospitable to most life forms...and are currently on course for ecological Armageddon."

"If we lose the insects...then everything is going to collapse."<sup>4</sup>

It's alarming to realise that my anecdotal observations have been confirmed by the grim facts of a scientific study which has concluded that the flying insect community has been decimated over the last few decades.

Similar studies in North America and Europe confirm this shocking decline insect populations. For example a 36 year study in Puerto Rico reported a biomass loss of 98% for ground dwelling and 78% for canopy dwelling arthropods.<sup>5</sup> In Europe grassland butterflies populations are estimated to have declined by 50% between 1990 and 2011.<sup>6</sup> Similarly studies across the United Kingdom (UK) of Butterflies, Large Moths and Beetles over recent decades tell a similar story of massive decline in populations.<sup>3</sup>

"76% (44 out of 58 species studied) of the UK's resident and regular migrant Butterfly species declined in either population or occurrence (or both) over the past four decades."<sup>7</sup>



Chequered-skipper-butterfly - extinct

"Across Britain, the total abundance of Larger Moths declined significantly by 28% during the 40 years period from 1968 to 2007."<sup>8</sup>

Sixty-two species of moths became extinct in Britain during the twentieth century and several more are now thought to have been lost including the Orange Upperwing, Boardered Gothic and Brighton Wainscote moths. The V-Moth (*Macaria wauaria*) recorded a 99% fall in its numbers between 1968 and 2007 and is now also threatened with extinction.<sup>8</sup>



Two-Spotted Ladybird- in decline

But it's not just Butterflies and Moths that are suffering. Studies of 68 species of Beetle across the UK over 15 years found that 75% had declined in numbers. For example, many of Britain's native species of Ladybirds are suffering serious declines. A survey of the Two-Spotted Ladybird in 2012 found that populations had slumped by 44%. Also, populations of both wild and domesticated bees have witnessed a steep decline.<sup>3</sup>

"Urgent need to uncover the causes of this decline...and to understand the ramifications of the decline for ecosystems."<sup>2</sup>

Species such as Butterflies and Larger Moths are relatively easy to identify and are well studied. They can act as indicators of the wider state of insects populations and as a sensitive gauge of the impacts of habitat change, pesticide use or climate change on wider biodiversity within an ecosystem.<sup>7</sup> Their overall decline is indicative of the rapid loss of insect biodiversity in Britain, and other countries, which may have substantial impacts on other wildlife and effect the delivery of some ecosystem services.<sup>8</sup>

"The decline and extinction of species is occurring at a rapid rate."<sup>8</sup>

Studies over 40 years of insect population trends and other results provide grim evidence of steep declines. These show few signs of recovery despite the best efforts of conservation organisations and large government expenditure.<sup>7</sup> Which is of great concern as the substantial decline of Britain's insects is one of the clearest signals yet of potentially catastrophic biodiversity loss caused by human impacts on the environment.

- 1 Monbiot.G (2017)  
*Insectageddon: farming is more catastrophic than climate breakdown*  
The Guardian (20/10/2017)
- 2 Caspar A. Hallmann.C, Sorg.M, Jongejans.E, Siepel. H, Nick Hofland.N, Schwan. H, Stenmans.W, Müller. A, Sumser.H, Hörrén.T, Goulson.D, de Kroon. H (2017)  
*More than 75 percent decline over 27 years in total flying insect biomass in protected areas.*  
PLOS One – 18 October 2017  
3...McKie.R (2018)  
*Where have all the insects gone?*  
The Guardian (17/06/2018)
- 4... Goulson.D (2018) In : McKie.R (2018)  
*Where have all the insects gone?*  
The Guardian (17/06/2018)
- 5 Lister.B and Garcia.A (2018)  
*Climate driven declines in arthropod abundance restructure a rainforest food web.*  
PNAS October 30, 2018 115 (44) E10397-E10406
- 6...Van Swaay. C et al (2013)  
*The European grassland butterfly indication 1990- 2011.*  
European Environment Agency
- 7 Butterfly Conservation (2015)  
*The State of the UK's Butterflies (2015)*  
Butterfly Conservation, Wareham UK
- 8 Butterfly Conservation and Rothamsted Research (2013)  
*The State of Britain's Larger Moths.*  
Butterfly Conservation. Wareham. Dorset

