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MASS INSECT MIGRATIONS IN UK SKIES

For the first time, scientists have measured the movements of high-flying insects in the skies over southern England – and found that about 3.5 trillion migrate over the region every year.

Scientists recorded movement above radar sites in southern England and found large seasonal differences, with mass migrations of insects generally going northwards in spring and southwards in autumn. Until now, radar studies have measured migrations of relatively few nocturnal species of agricultural pests, and no study previously examined the vast numbers of daytime migrants. Researchers from the University of Exeter and Rothamsted Research, which receives strategic funding from the BBSRC, captured the movement of 3,200 tons of biomass, using specialised radar techniques. This movement is more than seven times the mass of the 30 million songbirds which depart the UK for Africa each autumn. It is also the equivalent of about 20,000 flying reindeer. The study is published today in the journal *Science*.

Dr Jason Chapman, of the Centre for Ecology and Conservation at the University of Exeter's Penryn Campus in Cornwall, said: 'Insect bodies are rich in nutrients and the importance of these movements is underappreciated. If the densities observed over southern UK are extrapolated to the airspace above all continental landmasses, high-altitude insect migration represents the most important annual animal movement in ecosystems on land, comparable to the most significant oceanic migrations.'

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Dr Gao Hu, a visiting scholar with Dr Chapman from Nanjing Agricultural University, China, led the analyses of the radar data. He said: 'Many of the insects we studied provide important ecological services which are essential for maintaining healthy ecosystems, such as pollination, predation of crop pests and providing food for insectivorous birds and bats.'

Co-author Dr Ka S (Jason) Lim, of the Radar Entomology Unit of the AgroEcology Department at Rothamsted Research, said migratory insects can serve as indicators of global environmental condition, 'Animal migration, especially in insects, is a very complex behaviour which takes millions of year to evolve and is very sensitive to climatic condition, Global climatic change could cause decline of many species, but equally other highly adaptable species thrive and become agricultural crop pests.'

The study focussed on insects flying more than 150 metres above the ground, using radar for larger insects (10mg and over) and netting samples for smaller ones.

The paper, published in the journal *Science*, is entitled: "Mass seasonal bioflows of high-flying insect migrants".