Global Insect Biodiversity: Frequently Asked Questions

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What is happening to insects? Are they dying out?

- Insects and related arthropods are critical to ecosystems all over the world. We and much of life on Earth as we know it would be doomed if all insects disappeared. But, while many insect species are seriously threatened, projections of a looming mass extinction of insects are premature.
- Nevertheless, we should be concerned. Climate change, human land use, and invasive species are driving changes in insect population sizes and biodiversity and affecting the roles they play in our ecosystems.
- For instance: Habitat destruction shrinks available land for insects. Intensive agricultural activity reduces diversity and amount of food and habitat that insects need. Global trade and travel moves non-native insect species to new regions where they disrupt local ecosystems. Over-use of pesticides can negatively affect non-target insect populations. And climate change represents multiple threats to insect life: such as shifting life cycles and geographic ranges, stressing the plants insects feed on, and increasing the likelihood of droughts and fires.

What about recent studies that show declines in global insect populations?

- These studies are very concerning. However, some of the claims extrapolated from these reports in the media have been extended well past the limits of the data or have been otherwise over-hyped. The underlying science does not indicate that a global “insect apocalypse” is anywhere near imminent.
- But, taken collectively, these studies on insect declines should serve as a call to action to better understand how people are affecting insect biodiversity, how insects’ role in ecosystems might be threatened, what diminished insect numbers could mean for food security and our economies, and how our impact on insects can be reduced.
- We have little historical data about what “normal” numbers for insect species are, and so it is difficult to evaluate what is happening now and the timelines of reported declines. This hampers our ability to assess what is going on and make predictions about the future.
- In some groups of insects in some regions, declines have been documented, such as some butterflies and some bees and beetles, primarily in Europe and U.K. In some other areas, studies have seen increases in some insect species. But, in many regions and for many kinds of insects, we simply don’t know enough. There is an urgent need to get robust data from tropical and arctic regions, as well as much of the southern hemisphere, and to understand the drivers and consequences of variations in insect numbers.

Why is there so much concern over insect declines, while at the same time we hear so much concern over the impact of insect pests, like mosquitoes, stink bugs, or ticks?

- The common thread here is that people affect ecosystems: While many beneficial insects are harmed by these impacts to the environment, by the same token, some insects come to be seen as "pests" precisely because they're well-suited to living in environments altered by people. However, not all insect pests are thriving, and some that we see as pests nonetheless have important ecosystem roles that would be sorely missed if those insects disappeared.

What should we be doing to protect insects?

- Millions of insect species remain undiscovered and undescribed. We should be concerned with how much we still don't know about how human activity affects global insect and arthropod biodiversity.
- We need a lot more research that looks at insect population and biodiversity changes over time, and we need to do these studies on many kinds of insects in many different habitats, including urban, agricultural, and unmanaged landscapes. Studies are especially needed from tropical, alpine, montane, and arctic sites and from understudied regions of the world, including Africa, Australia, and the South Pacific.
- Globally, climate change is the one of the greatest threats facing the planet's biodiversity and humanity. We must embrace and support efforts to develop clean energy, conserve habitats, reduce pollution, protect native plants and animals, and prevent the spread of invasive species.
- Individually, actions that people can take include maintaining plant diversity in their yards and leaving natural habitat, like leaf litter and dead wood, to provide much-needed resources for insects; carefully reading the label prior to using any insect management products; and recognizing that insects are an important part of our ecosystem.

What are entomologists doing to protect insects?

- Entomologists are studying how human activity affects insect biodiversity and how this in turn affects our lives by eroding food security, escalating diseases transmitted by insects, and opening doors for invasive species. We need public awareness and support to expand research in entomology, insect ecology, biosystematics, invertebrate conservation, and more and translate knowledge into positive action.
- The Entomological Society of America continues to advocate for support and funding of research we need to better understand insects, their role and status in Earth's ecosystems, and humanity's impacts on both.
- ESA urges the broad adoption of integrated pest management (IPM) practices in urban and agricultural areas. Insecticides are important components of IPM programs, but effective IPM aims to take a varied, comprehensive approach to managing pests that is economically and ecologically sustainable. That means combining chemical control with various other methods, such as growing resistant plant breeds, introducing beneficial predator insects, or simply managing local habitat to provide the resources that beneficial insects need to survive.