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Protecting the Web of Life

ESA Position Statement on Insects and Biodiversity

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The Earth hosts an extraordinary variety of living organisms. Collectively, this complex system of interconnected animals, plants, and microorganisms is referred to as the biosphere, or, more commonly, as planetary biodiversity. Biodiversity is the single most valuable resource available to Earth's human inhabitants. In simplest terms, biodiversity is the comprehensive variety and variability of life on Earth—the full spectrum of species, populations, interactions, behaviors, and gene pools that compose the living world.

As scientists and citizens, it is important to study and understand the complexity of biodiversity. Measuring and documenting biodiversity provides fundamental information about the status and relative health of living organisms and the environments where they are found (e.g., indicator species). Although human activities affect these environments, preemptive actions can mitigate potential negative impacts on biodiversity. However, significant challenges to preserving planetary biodiversity that are influenced by human activity include:

- *Habitat loss*: Growing human populations cause direct habitat destruction (e.g., deforestation) and damage habitats through environmental pollution and contamination.
- *Limited land for food production*: With the global human population expected to exceed 9 billion by 2050, if not sooner, the need for increased food production—even though all available arable land is already in use—will require more intensive management of agricultural systems, impacting biodiversity in these systems and adjacent areas.
- *Invasive species*: The introduction of exotic species, whether intentional or unintentional, can lead to direct competition with or perhaps even extinction of native species. Approximately 42% of threatened or endangered species are at risk primarily due to the introduction of invasive species, and that loss of biodiversity results in billions of dollars of economic damage annually¹.
- *Alterations in ecosystem composition*: Changes in relative abundance of species and how they interact with their environments typically lead to further loss in biodiversity and habitat.
- *Over-exploitation*: Unregulated collection of threatened and endangered species is unsustainable and, if not managed, leads to species loss.

- *Global climate challenges:* Biological systems typically respond slowly to environmental change; accelerated changes in climate rapidly affect life-cycle timing and habitat availability, altering ecosystems and contributing to biodiversity loss. (For example, in warmer temperatures, pest species can infest crops earlier in growing seasons, change distributions or hosts, or progress through additional generations in a growing season.)

Insect Biodiversity

More than half of all species on Earth are insects and related arthropods, with 1.5-2 million species alone already described (known to science and assigned a scientific name) and an estimated millions more awaiting discovery or description. As the largest and most diverse lineage of living organisms, insects play dominant and vital roles in nearly every ecosystem; as pollinators, decomposers, predators and natural enemies against invasive species and agricultural pests, potential sources for new genetic and medical breakthroughs, and food for other organisms. Insect species and populations are also valuable indicators of biodiversity and ecosystem health and stability, and monitoring key insect groups can assist with early detection of potential ecological shifts that might adversely affect human welfare.

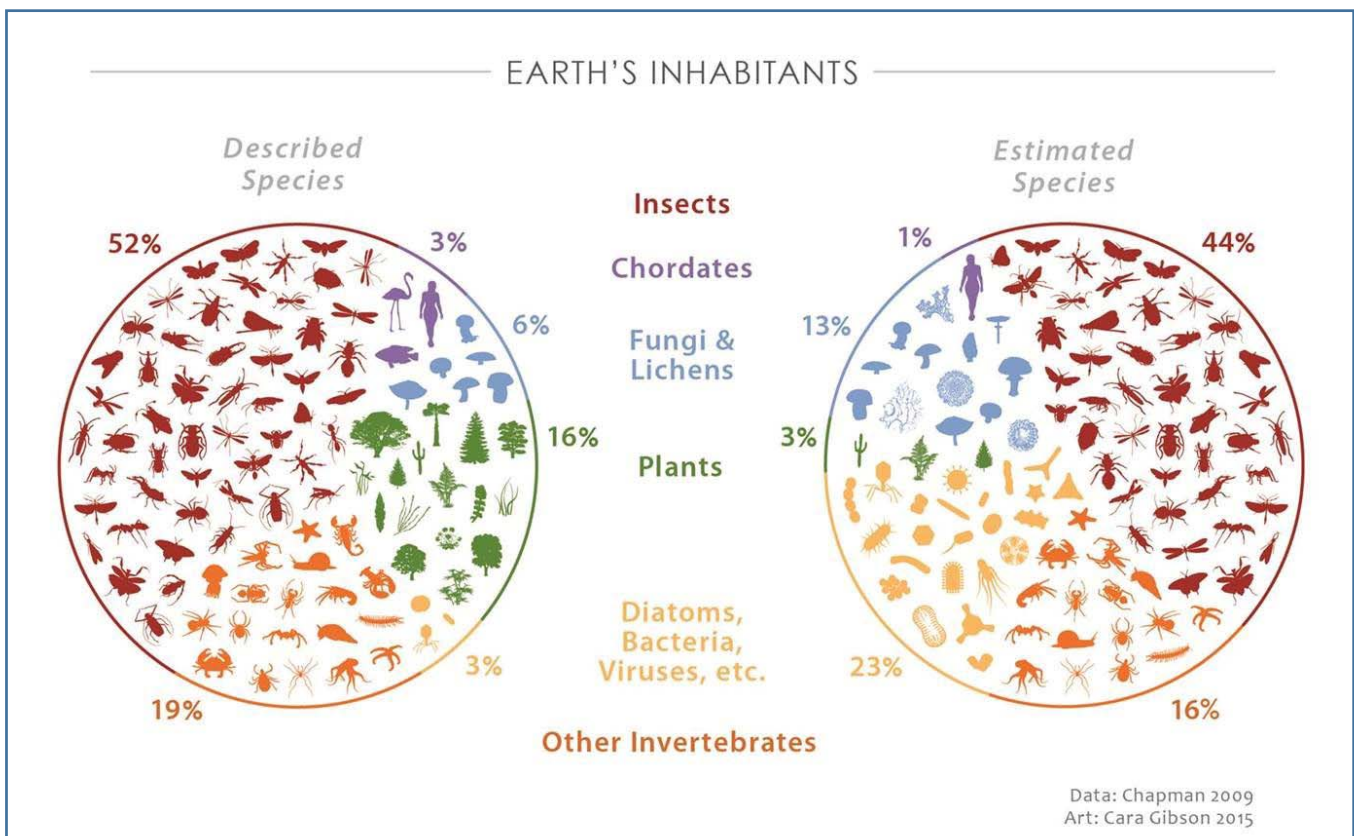


Chart is best viewed in color

The Entomological Society of America (ESA) advocates for the protection and exploration of Earth's biodiversity, particularly with regard to insects and other related arthropods, and for the appropriate attention and funding to be directed toward developing policies and procedures to do so, specifically in the following areas:

- **Continued Study** of insects and their relatives, together with all aspects of their biology including behavior, physiology, ecology, population dynamics, genetics, systematics and taxonomy, and potential values to humanity.
- **Habitat Protection**, ensuring and maintaining a complete range of intact natural ecosystems and their dynamics, with an emphasis on native species.
- **Increased Discovery** and exploration of biodiversity within our country and our world with regard to new species, ecosystem processes, and products that will enrich or protect the human enterprise.
- **Enhanced Domestic and International Collaboration** and cooperation between entomologists, other scientists, lawyers, policymakers, and citizens to work together to prevent the loss of native species and populations and to prevent the introduction of potentially damaging exotic species.
- **Improved Management Techniques and Best Practices**, utilizing effective science-based management of specific highly injurious pest and vector species, without destruction of beneficial and neutral species or severe disruption of ecosystems.

ESA is the largest organization in the world serving the professional and scientific needs of entomologists and people in related disciplines. ESA today has over 6,000 members affiliated with educational institutions, health agencies, private industry, and government. Headquartered in Annapolis, Maryland, the Society stands ready as a non-partisan scientific and educational resource for all insect-related topics. For more information, visit www.entsoc.org.

¹ <https://www.nwf.org/Wildlife/Threats-to-Wildlife/Invasive-Species.aspx>