PROTECTING INSECTS IS VITALLY IMPORTANT TO THE UNITED STATES

ESA Position Statement on Threatened and Endangered Insect Species
Approved on October 30, 2021
Valid through October 30, 2025

SUMMARY

The Endangered Species Act is one of America's key tools to protect species and the ecosystems that sustain them. While the Act needs improvement to better protect insects—far more vertebrates are listed as endangered or threatened, despite insects' greater abundance and diversity—overall, the Act benefits the common good and is cost-effective. The Entomological Society of America advocates for the Endangered Species Act to be maintained and adequately funded, with strengthened collaboration between federal and state agencies, regulated stakeholders, and researchers.

OVERVIEW

Healthy ecosystems provide essential benefits to humanity. Terrestrial ecosystem services, for example, are estimated to be worth at least $21 trillion per year[1]. A key component of healthy ecosystems is biodiversity, defined simply as the number of different kinds of organisms and their abundance. Insects comprise 60 percent of all known species and inhabit all terrestrial and freshwater environments, playing critical roles as pollinators, scavengers, and decomposers. Insects are also key food sources for other animals and key predators of other organisms; in fact, insects are the most important predators of other insects. However, concerns about declining insect biodiversity have earned public attention in recent years, and habitat loss and climate change are major contributors to such declines where they have been observed. Because insects typically have specific habitat requirements and are sensitive to environmental changes, they can be useful indicators of environmental health, analogous to the "canary in the coal mine" that signals impending threats. Therefore, we must protect insect populations by preserving their habitat and slowing climate change—as well as taking special care to protect threatened and endangered insect species.

THE ENDANGERED SPECIES ACT BENEFITS THE COMMON GOOD AND IS COST-EFFECTIVE

The Endangered Species Act of 1973, approved by Congress without controversy, is one of America's key statutory conservation laws to protect species and the ecosystems that sustain them and thereby prevent extinctions. Because the relationships among all organisms and their environments is highly complex and often not well understood, any loss of species or significant reduction in abundance risks unpredictable and catastrophic consequences. And, because habitat protection is a key action through which the ESA is implemented, the law also preserves well-functioning ecosystem services, bringing tangible economic benefits to society.

The Endangered Species Act provides for regulatory listings of species that are classified as threatened or endangered. Presently, 93 insect species are listed as threatened or endangered. Despite the much greater biodiversity of insects than of other animals and plants, about five times as many vertebrates are listed than insects. Reasons for this include habitat specificity, dependence on a host plant or animal that is itself rare, restrictions for listing subspecies, the blanket prohibition of listing any species that could potentially become a pest, and the fact that many insect groups are understudied.

[1]Costanza, R, et al. *Nature*, 1997, 387, 253–260. 1997 published estimate adjusted for inflation.

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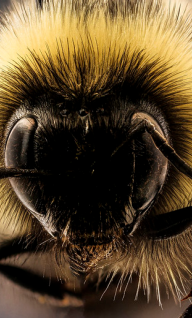

One economically important endangered insect species is the rusty patched bumble bee, *Bombus affinis*. Its addition to the U.S. Endangered Species list in 2017 occurred after more than a decade of research and advocacy. This species, common across the Midwest and eastern U.S. and Canada as late as the 1990s, now inhabits just 0.1 percent of its historic range. It is an excellent pollinator of cranberries; contributes to the pollination of plums, apples, and several dozen species of native wildflowers; and has been on the International Union for the Conservation of Nature (IUCN) Red List since 2014.

Another endangered and beneficial insect is the American burying beetle, *Nicrophorus americanus*, which once occurred in 35 states from Texas to Canada and Florida to Maine. Today, populations remain in only six states. Adult beetles bury animal carcasses to feed their offspring, benefiting people by removing breeding habitat for flies that can transmit diseases to people, pets, and livestock. The beetle's saliva, which inhibits bacterial and fungal decomposition of the carrion, is a potential source of new antibiotics and new ways to preserve food.

Federal and state agencies spend nearly $1.5 billion per year to implement the Endangered Species Act. During fiscal year (FY) 2017, listed insect species protection expenditures totaled only $1.2 million, but the economic return on protecting the biodiversity of insects is far greater. For example, non-honey bee native pollinator insects (such as the rusty patched bumble bee) contribute to more than $4.4 billion[2] in pollination services to U.S. crops. Meanwhile, the biological control services that insects provide by feeding on crop and forest pests has been estimated to exceed $6 billion annually, and decomposition is valued at more than $500 million[3]. In short, threatened and endangered species protection is a worthwhile investment, and, in the case of insect conservation, the cost is low compared to the economic returns.

As written and implemented, the Act allows a great deal of room for compromise, especially for site-specific actions. However, there is opportunity to improve the evaluation process for listing insects. Scientific evidence should remain a foundation for decision-making.

THE ENDANGERED SPECIES ACT WORKS

The Act has likely prevented the extinction of at least 290 species[4]. About half of the currently listed species are now stable or increasing in numbers, including at least 100 species that have seen dramatic improvements in distribution and population size. Of some 1,400 U.S. species that have been listed as endangered, about 2.5 percent have recovered sufficiently to be taken off the list, reflecting the fact that complete recovery of a species typically takes decades. The longer a species has been on the list, the more likely it is to show improvement in population size and distribution. Thus, the Endangered Species Act is necessary to continue protecting those species already listed as endangered and others that are currently in decline or threatened.

ESA advocates the following positions regarding the U.S. Endangered Species Act of 1973:

- The decision to protect a species should be made on the basis of current scientific evidence, to inform listing and prioritization schemes.

- Insect conservation is critical to healthy ecosystems, but a clear bias toward plants and vertebrates exists in the listing process. The population dynamics, interpretations of species boundaries, taxonomic conventions, and other challenges related to identifying and counting insects should be accounted for when assessing their status. Here, the Endangered Species Act needs improvement.

- A key mitigation requirement for protecting listed species is conserving habitat. This focus is a strength of the Endangered Species Act because all organisms will benefit, thus preserving biodiversity as an essential component of ecosystem services.

[2]Calderone, NW. *PLOS One*, 2012, 7:5, e37235. 2009 published estimate adjusted for inflation.
[3]Losey JE, Vaughan M. BioScience, 56:4, 2006, 311–323.
[4]Greenwald, N, et al. PeerJ, 2019, 7:e6803.

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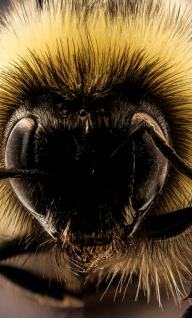

- Collaboration should be supported and encouraged between federal and state agencies, regulated stakeholders, and researchers.

- Recovery plans must continue to take into account the input of multiple stakeholders beyond scientists, including landowners, developers, the agriculture community, and the general public, and the impacts that these plans may have on critical activities.

- **The Endangered Species Act should be maintained and adequately funded, with a strengthening of the collaboration required for implementation. The Act works.**

The Entomological Society of America is the largest organization in the world serving the needs of entomologists and other insect scientists. ESA stands as a resource for policymakers and the general public who seek to understand the importance and diversity of earth's most diverse life form—insects. Learn more at www.entsoc.org.

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