



IOWA CHAPTER

What's Happening to our Insects?

Insect populations are declining in Iowa and across the globe.

Anecdotally, it appears that insect populations have declined precipitously across the state. The first evidence is the lack of insects splattered on windshields as compared to years ago. It also seems that there are fewer insects seen while people are hiking and there are fewer insects in our yards. Furthermore, indications are that insect populations across the globe are plummeting. Unfortunately few scientific records of insect populations exist. Media outlets regularly report on the collapse of honey bees and the loss of the monarch butterflies. But the population collapses do not end there.



Not all insects are pests.

Our ecosystem depends on insects. Not all insects are pests. Insects are important for pollination. They also aid in decomposing plants and deceased animals. Insects aerate the soil when they burrow and their remains fertilize the soil. Insects provide food for other animals, including birds and bats. Some insects eat weed seeds, which helps reduce the growth of weeds. Some insects eat other insects, keeping their populations in check.

- “Seventy of the 100 crop species that provide 90% of food worldwide are pollinated by bees.”¹
- “Scientists estimate that one-third of all cash crops depend on animal-mediated pollination.”²
- “Looking at just four services – dung burial, control of crop pests, pollination, and wildlife nutrition – Losey and Vaughan calculate that the annual value of insects in these roles is at least \$57 billion in the United States. \$50 billion of this amount comes from the value of insects in sustaining hunting, fishing, and other nature-oriented activities, while \$4.5 billion is attributed to natural pest control and at least \$3 billion is from pollination.”³
- “Insects are the lynchpins of many ecosystems. Around 60 percent of birds rely on them for food. Around 80 percent of wild plants depend on them for pollination.”⁴
- “Scientists have described 1 million species of insects so far, and estimate that at least 4 million species worldwide are still unrecorded.”⁵

Many reasons are suspected.

Many reasons are suspected for the decrease in insects, although no definitive answer has been determined. The suspected reasons include:

- Pesticide use – pesticides kill beneficial insects as well as pests.

¹ “Where have all our insects gone?” *The Guardian*, June 17, 2018

² Annie Roth, “Light pollution lures nighttime pollinators away from plants”, *Mongabay*, December 13, 2017

³ Rhett A. Butler, “Insects worth \$57 billion to US economy”, *Mongabay*, April 1, 2006; also see John E. Losey and Mace Vaughn, “The Economic Value of Ecological Services Provided by Insects”, *BioScience Magazine*, Volume 56 Number 4, April, 2016

⁴ Ed Yong, “Insects Are In Serious Trouble”, *The Atlantic*, October 19, 2017

⁵ Christian Schwagerl, “What’s Causing the Sharp Decline in Insects, and Why it Matters”, *Yale Environment 360*, July 6, 2016

- Pollution in the environment affects insects.
- As land has been converted to row crops, roads, housing, and businesses, there is less land available for insects.
- Along with the loss of habitat is the loss of native plants, which provide food for the insects. The monoculture of corn and soybeans results in almost no insects on the crop fields, beyond the pests that appear.
- The spread of alien species has resulted in the alien insect species replacing the native species. It has also resulted alien plants replacing the native plants that insects are adapted to.
- Light pollution that changes behaviors in insect populations and can make them easy prey. Night-time lighting has a huge impact, one that we often don't think about. "Half of all insect species are nocturnal. As such, they depend on darkness and natural light from the moon and stars for orientation and movement or to escape from predators, and to go about their nightly tasks of seeking food and reproducing. An artificially lit night disturbs this natural behaviour - and has a negative impact on their chances of survival,"⁶ according to Dr. Maja Grubisic, a researcher studying the effects of light on insects.
- Climate change – changes in growing seasons affect insects and when their food is available. Severe storms, droughts, flooding, and heavy rainfalls reduce the ability of insects to survive.



There are things you can do.

Regardless of the reasons, the loss of insects is alarming. There are things you can do, such as:

- Planting a variety of flowers that bloom throughout the season, providing nectar for a variety of insects. Planting milkweed for monarch butterflies.
- Reducing the use of pesticides in your yard. Use only the amount needed to keep the insect pests in check. Read the label on the container and follow the instructions to insure that the proper amount is applied.
- Keeping an organic lawn and garden.
- Advocating for re-wilding the state, restoring natural areas and protecting natural areas. You can re-wild your own property.
- Reducing outdoor lighting.
- Buying organic foods – fruits, vegetables, meats, dairy products, and eggs. Pesticides are not used in their production.
- Advocating for research money and efforts to study causes and solutions, including long-term monitoring of insects.

Insects are part of the web of life.

“Scientists have warned that a human-caused sixth mass extinction is now underway on Earth. Vertebrate species, both on land and under the sea, are threatened at a global scale because of human activities. . . the proportion of insects in decline is currently twice as high as that of vertebrates and the insect extinction irate is eight times faster than that of mammals, birds and reptiles.”⁷

“The loss of even a small percent of insects might also be disproportionately consequential. They sit at the base of the food web; if they go down, so will many birds, bats, spiders, and other predators.”⁸

When pieces of the web are removed, what follows is a cascade of species that decline or disappear, eventually becoming extinct. Michelle Trautwein, from the California Academy of Sciences states “Our mistreatment of the planet has been recognizably bad for elephants and coral reefs, but it seems likely that it has also been just as bad

⁶ “Light pollution a reason for insect decline”, *Science Daily*, June 19, 2018

⁷ Dominique Mosbergen, “Insects Are Dying En Masse, Risking ‘Catastrophic’ Collapse of Earth’s Ecosystems”, *Huffington Post*, February 11, 2019

⁸ Ed Yong, “Is the Insect Apocalypse Really Upon Us?” *The Atlantic*, February 19, 2019

for flies, moths, beetles.”⁹ Peter Brannen, author and science journalist, explains that “when mass extinctions hit, they don’t just take out big charismatic megafauna, like elephants ... They take out hardy and ubiquitous organisms as well - things like clams and plants and insects.”¹⁰ Iowa is not immune to the loss of prairie plants, insects, birds, turtles, and other native plants and animals.

What’s more, without insects, many of the foods we eat will not get pollinated, which will result in rising food costs. Among those foods are carrots, broccoli, apples, grapes, cucumbers, squash, pumpkins, and raspberries.



Insects belong in the environment!

Sources

Brian Bienkowski, “Bugs are full of our drugs – and they could be getting other critters hooked, too”, *Environmental Health News*, November 7, 2018

Rhett A. Butler, “Insects worth \$57 billion to US economy”, *Mongabay*, April 1, 2006

Michael DiBartolomeis, Susan Kegley, Pierre Mineau, Rosemarie Radford, Kendra Klein, “An assessment of acute insecticide toxicity loading (AITL) of chemical pesticides used on agricultural land in the United States”, *Plos*, August 6, 2019

Damian Carrington, “Buy organic food to help curb global insect collapse, say scientists”, *The Guardian*, February 13, 2019

Ben Guarino, “‘Hyperalarming’ study shows massive insect loss”, *The Washington Post*, October 15, 2018

Robert Hunziker, “Insect Decimation Upstages Global Warming”, *CounterPunch*, March 27, 2018

Brooke Jarvis, “The Insect Apocalypse Is Here”, *New York Times*, November 27, 2018

Brandon Keim, “Why are big, insect-eating birds disappearing? Maybe we’re running low on bugs.” *Anthropocene Magazine*, March 14, 2018

Damian Carrington, “Buy organic food to help curb global insect collapse, say scientists”, *The Guardian*, February 13, 2019

Damian Carrington, “Plummeting insect numbers ‘threaten collapse of nature’”, *The Guardian*, February 10, 2019

Dave Goulson, “The insect apocalypse: ‘Our world will grind to a halt without them’”, *The Guardian*, July 25, 2021

Iowa’s Wildlife Action Plan, www.iowadnr.gov/Conservation/Iowas-Wildlife/Iowa-Wildlife-Action-Plan

Eva Knop, Leana Zoller, Remo Ryser, Christopher Gerpe, Maurin Hörler, and Colin Fontaine, “Artificial light at night as a new threat to pollination”, *Nature*, volume 548, pages 206–209, August 10, 2017

⁹ Ed Yong, “Insects Are In Serious Trouble”, *The Atlantic*, October 19, 2017

¹⁰ Ed Yong, “Insects Are In Serious Trouble”, *The Atlantic*, October 19, 2017

Stephen Leahy, "Insect 'apocalypse' in U.S. driven by 50x increase in toxic pesticides", *National Geographic*, August 6, 2019

"Light pollution a reason for insect decline", *Science Daily*, June 19, 2018

John E. Losey and Mace Vaughn, "The Economic Value of Ecological Services Provided by Insects", *BioScience Magazine*, Volume 56 Number 4, April, 2016

Euan McKirdy, "New study suggests insect populations have declined by 75% over 3 decades", *CNN*, October 20, 2017

George Monbiot, "The Unseen World", *The Guardian*, December 19, 2017

Dominique Mosbergen, "Insects Are Dying En Masse, Risking 'Catastrophic' Collapse of Earth's Ecosystems", *Huffington Post*, February 11, 2019

Silke Nebel, Alex Mills, Jon D. McCracken, Philip D. Taylor, "Declines of Aerial Insectivores in North America Follow a Geographic Gradient", *Avian Conservation and Ecology*, 2010

Tom Philpott, "A new study reveals just how toxic a bee's world has become", *Mother Jones*, August 7, 2019

Mark Rigby, "Insect population decline leaves Australian scientists scratching for solutions", *ABC Far North*, February 23, 2018

Annie Roth, "Light pollution lures nighttime pollinators away from plants", *Mongabay*, December 13, 2017

Francisco Sanchez-Bayo and Kris A. G. Wyckhuys, "Worldwide decline of the entomofauna: A review of its drivers", *Biological Conservation*, 232 (2019) 8-27

Christian Schwagerl, "What's Causing the Sharp Decline in Insects, and Why it Matters", *Yale Environment 360*, July 6, 2016

Milan Solly, "'Safe' Levels of Pesticide Still Hamper Bees' Memory and Ability to Learn", *Smithsonian.com*, July 12, 2018

"Where have all our insects gone?" *The Guardian*, June 17, 2018

Ed Yong, "Insects Are In Serious Trouble", *The Atlantic*, October 19, 2017

Ed Yong, "Is the Insect Apocalypse Really Upon Us?" *The Atlantic*, February 19, 2019

Universität Basel, "City moths avoid the light." *ScienceDaily*, April 4, 2016

University of Bern, "Light pollution as a new threat to pollination." *ScienceDaily*, August 2, 2017

University of Sheffield, "Insects feel the heat: Scientists reveal rise in temperature affects ability to reproduce." *ScienceDaily*, January 9, 2017.

"Ecological Armageddon! Insects Vanish All over the World", <https://www.youtube.com/watch?v=EAOnySPnt3E>

John Vidal, "The Rapid Decline Of The Natural World IS A Crisis Even Bigger Than Climate Change", *HuffPost*, March 15, 2019

Robert Walker, "The Insect Apocalypse Is Coming: Here Are Five Lessons We Must Learn", *Truthout*, April 7, 2019

