Policy Tip Sheet

POLICY ANALYSIS FROM
THE HEARTLAND INSTITUTE

Wind Energy's Impact on Birds, Bats, and Insects

"Overall, multiple academic studies have found that wind energy generation in the United States alone was estimated to have killed between 600,000 to 888,000 bats, 214,000 to 368,000 small birds, and between 234,000 to 573,000 birds of all sizes in 2012."

Substantial research has been conducted that links wind turbines to avian fatalities. The majority of birds that are impacted by wind turbines are birds of prey. Wind turbines create wind vortexes that draw in birds and cause fatal collisions with the turbine blades. Birds of prey and wind developers are both drawn to the same sites—hills, ridges, and other elevated areas—where stronger currents provide more stable power for wind turbines, while also providing a greater lift for soaring birds. In fact, as the Department of Energy explained in a 1997 budget request, "wind farms have been documented to act as both bait and executioner—rodents taking shelter at the base of turbines multiply with the protection from raptors [another word for birds of prey], while in turn their greater numbers attract more raptors to the farm."

For a more concrete real world example, researchers in India found approximately four times fewer buzzards, hawks, kites, and other large birds in areas with wind farms. Moreover, the loss of the ecosystem's primary predators has had a ripple effect on the food chain, with many small animal populations growing unchecked. In the United States, the expansion of wind turbines could result in the extinction of the golden eagle. Generally speaking, wind energy threatens large birds such as eagles, owls, hawks, kestrels, kites, and falcons disproportionately to their smaller cousins. This is especially concerning because these larger birds are of higher conservation value and because they do not reproduce at a high rate.

Bats, too, are heavily affected by wind turbines. Bats die from sudden drops in air pressure, as their lungs cannot accommodate for the change in pressure caused by the turbine-induced wind vortex. Though bats are typically able to detect man-made structures and avoid them by using echolocation, turbine blades are undetectable due to the pressure drops. As such, wind turbines kill bats in two ways: turbine blades directly collide with bats, and wind vortexes cause bats lungs to collapse.

The Institute for Energy Research contends that "wind turbines are the single greatest human threat to migratory bats, which live in different habitats during summer and winter months." Scientists warned in 2017 that the hoary bat could become extinct if wind farm expansion continues. U.S. Geological Survey research biologist Paul Cryan emphasized in a 2011 article published in *Environmental Law*, "Wind energy facilities kill a significant number of bats far exceeding any documented natural or human-caused sources of mortality in the affected species…There are no other well-documented threats to populations of migratory tree bats that cause mortality of similar magnitude to that observed at wind turbines."

Overall, multiple academic studies have found that wind energy generation in the United States alone was estimated to have killed between 600,000 to 888,000 bats, 214,000 to 368,000 small birds, and between 234,000 to 573,000 birds of all sizes in 2012. And, since wind energy production has more than doubled in the past decade, these numbers are likely twice as high today.

Impact on Insects

Until very recently, little research had been conducted on the impact of wind turbines upon the insect population, though this issue is starting to gain more attention. Insects are vital to the planet for many reasons, not the least of which is their importance to food production. At least 75 percent of global food crop types depend on insect pollinators, including 70 of the 100 most important human food crops.

One global assessment suggests that land-based insect abundance has declined by 9 percent per decade since the 1960s, for an overall decline of 43 percent. Another study estimates that approximately 10 percent

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of all insect species are critically endangered. Bees are particularly at risk; more than 100 wild bee species are at various levels of endangerment, which is especially frightening when considering honeybees alone carry out 80 percent of overall U.S. crop pollination. Moreover, insects are a vital source of food for many animal populations; with less insects available to eat, there would almost certainly be cascading effects upon animal populations and the ecosystem's food chain.

Ironically, the same environmental groups bemoaning the rapidly declining insect population are typically the same groups championing the use of green energy, such as wind turbines. And, recent studies have proven that wind turbines have a direct causal effect upon insect death. One study conducted by the German Aerospace Center estimated that 1,200 tons of insect biomass are lost annually to collisions with Germany's 30,000 onshore wind turbines. As another academic article explains, "Assuming an average wet mass of 1 mg for an insect… this equates to about 1.2 trillion insects killed per year for all onshore wind turbines in Germany, or 40 million insects killed annually be a single wind turbine in Germany."

There are approximately 70,000 wind turbines in the United States as of 2022. As of 2016, there were 341,000 on the planet, according to the Global Wind Energy Council. Assuming that each wind turbine on the planet averages 40 million insect deaths annually, as in Germany, this would equate to approximately 2,800,000,000,000 (2.8 quadrillion) annual insect deaths attributable to wind turbines in the United States alone. As for the planet, this would equate to 13,640,000,000,000 (13.64 quadrillion) insect deaths attributable to wind turbines per year. And, the latter number is based upon 2016's global wind turbine count, which has almost certainly significantly increased in the past six years.

The vast amount of avian and insect deaths at the hands of wind turbines is disastrous in and of itself, from a conservation and ecological standpoint. Equally concerning, however, is the serious downstream effect upon crop production and the global food supply, especially at a time when farmers and agricultural producers are suffering from stringent environmental, social, and governance (ESG) score mandates. The most direct link between wind turbines and declining food production is the aforementioned reduction in pollinator insects, which will lead to less crop yields. A secondary link is that the declining insect populations will reduce the food available for other animals, many of which are relied upon for food as well. For example, birds that run out of insects to eat have begun to turn on each other, and eat one another to survive. Many land-based animals will suffer from population decline as well, even if they do not rely on insects for food. Many animals rely upon flora that needs to be pollinated by insects to grow; without pollinators, these animals will suffer.

Overall, ecosystems are incredibly complex, but insects have always provided the basis of the food chain. Without them, everything collapses. While it is difficult to quantify the precise degree to which wind turbines will affect the global food supply in the future, one thing is certain: wind turbines undoubtedly cause massive avian and insect deaths on a yearly basis.

Further Readings

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