

# Understanding the Global Impact of Light Pollution

written by Saarani Vengadesen | 09/03/2023

Along with the rapid growth of the human population, more and more environmental pollution has arisen due to the world's [urbanisation](#). Due to globalisation, more people are becoming aware of environmental pollution worldwide, and actions have been taken to mitigate the issue. However, light pollution remains underrated – although it is a worldwide issue that could significantly impact the environment, it is usually overlooked by people.



Light pollution is excessive artificial light, also a form of energy waste. To facilitate activities at night and enhance quality of life, people have been using lights in different areas to light up every corner of their activity range. Consequently, artificial light has become so widespread that it has formed a sky glow in urban areas, causing light pollution and threatening many animals in various ways.

First, it causes disorientation in wildlife. Insects such as moths and beetles have evolved unique adaptations of [photoreception](#), which make them sensitive to light and, therefore, are attracted to artificial light at night. This disrupts their navigation, which inhibits their [foraging](#) activity and [reproduction](#). Similarly, artificial light could disorient the newly hatched [turtles](#), attracting them to move inland instead of into the ocean, potentially threatening the populations of these marine reptiles.

According to the book [Ecological Consequences of Artificial Night Lighting](#), published by Island Press in 2006, both sky glow and lighting interfere with migratory birds' use of the horizon as a point of reference for direction when navigating at night. In many cases, birds also

crash into buildings with bright lights. Due to this phenomenon, which is especially prevalent in rainy and foggy weather, hundreds or even thousands of birds may be hurt or killed in a single night, reducing their ability to survive the winter.

In addition, light pollution disrupts the vision of animals. Nocturnal animals have developed better night vision due to having more rod cells (photoreceptors) in the eyes. However, a sudden increase in illumination could temporarily blind some nocturnal animals, such as frogs. This reduction in visual capability may require minutes to hours of recovery time. During this period, they cannot get visual information on prey, predators, or conspecifics, which may affect their ability to reproduce, avoid predators, and engage in foraging and social activities.

Moreover, light pollution could disrupt the [circadian rhythm](#) of animals and plants. Under artificial illumination, diurnal animals, such as birds, lizards, and spiders, may extend their active period. Some animals even develop [crepuscular behaviours](#), shifting their foraging activity into the night, increasing predation pressure on nocturnal animals, such as moths, frogs, birds, turtles, and fishes.

Besides animals, artificial light at night also disrupts plant flowering and growing patterns by affecting their metabolism, causing early leaf out, late leaf loss, and extended growing periods. This may reduce the food availability for the primary consumers, which brings cascading consequences to the food web and ecosystem.

Besides that, light pollution changes the [prey-predator relationship](#). In some [diurnal](#) animals, the artificial illumination at night increases their predatory activity intervals. In response to a perceived increased predation risk, prey species may reduce their activities in brighter surroundings. In other words, artificial light at night may temporarily benefit predators. However, due to the potential changes in prey behaviour, it may be harmful to predators in the long run.

Lastly, communications between animals could be obscured by artificial light, as some nocturnal animals rely on visual communications by emitting [bioluminescent](#) flashes to find potential mates. For example, the courtship display of fireflies involves exchanging bioluminescent messages often obscured by streetlights. Even though some insects can still see their surroundings, they are unable to recognise members of the same species, such as in the case of the horned beetles.

In summary, the impacts of light pollution could be catastrophic to the biotic communities and should not be underrated. Besides harming animals, light pollution also negatively impacts human health, such as [insomnia](#), [anxiety](#), and [obesity](#). More research is needed to shed more light on the issue of light pollution, and urgent actions are needed to promote the sustainable use of such energy while reducing its impact on the environment.

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