



## Light Pollution

**Light pollution** is a spillover effect from urbanization and poses several threats to nocturnal animals that have evolved to rely on the cover of darkness for nourishment, protection, and/or reproduction. Light pollution is a relatively recent phenomenon and animals have not had adequate time to adapt to this new reality, leading to disruptions in their life cycles that can have deadly consequences. For example, migratory birds that depend on navigational clues from the stars and the Moon have been recorded as being disoriented from the glow from artificial light, causing them to crash into buildings or fly in circles until they falter from exhaustion. The effects of artificial light are negatively affecting nocturnal reptiles, mammals, and insects in a similar fashion, leading to disruptions in food chains and ecosystem functionality. Luckily, there are actions we can take as individuals to decrease our own output of artificial light, and we inspire others, including city officials, building managers, and homeowners associations to do the same.

**Nocturnal Pollination** - Pollination, the natural mechanism through which plants reproduce, occurs at all hours of the day. While much of the research has been focused on pollinators that are active during the day (diurnal), critical pollination services are provided by nocturnal animals such as bats, bees, beetles, and most importantly, moths. While moth pollination has been less studied than bee pollination, research completed in the last few decades indicates that moth pollination is incredibly important to functioning ecosystems across the globe and that moths might even be more efficient pollinators than bees. As is the case with other pollinators, moths coevolved along with certain flowering plants, and both maintain certain characteristics that attract one another. For example, plants have evolved to take advantage of the keen sense of smell moths possess and produce especially fragrant flowers that open at night. Also, white or pale blooming flowers are more likely to attract moths because they are easier to see at night. These characteristics help us identify which plant species attract moths, although some plants are pollinated both during the day and at night. Certain species of moths and plants have evolved to become codependent on one another, as is the case with the famous relationship between the yucca plant and the yucca moth, which is the yucca flower's only pollinator. Moths are also recorded as traveling further distances than bees to find



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*Carolina Sphinx - Photographed by Brian Lowry*

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nutrients, leading researchers to believe that moths are an important player in maintaining genetic diversity across an ecosystem.

**How artificial light hurts pollinators** - Like other pollinators, moths are negatively affected by habitat loss, overuse of pesticides, encroachment from invasive species, and climate change. However, moths are most at risk from the effects of light pollution, as most moth species are nocturnal and use the benefit of darkness to feed, mate, and avoid predation. Moths also use distant natural lights, such as the Moon and stars to navigate. Light pollution disorients and confuses moths, causing them to pollinate less efficiently and exhibit the phenomenon known as “flight to light” where moths will fly towards or circle the artificial light source and eventually land. These moths are then easy prey for predators, such as birds, that have learned that certain lights attract moths in large numbers. Additionally, contact with hot surfaces from artificial lighting can kill or injure



*Hermit Sphinx - Photographed by Dean Smith*

moths. Light pollution can also inhibit the mating and reproductive process in nocturnal Lepidoptera and has been shown to have negative effects on moth larvae as well. These negative effects from light pollution have serious repercussions for ecosystem functionality and imperil certain moth species along with the plants they visit and pollinate. Without these specialist pollinators, ecosystems lose biodiversity and functionality and are less resilient to other threats like climate change and invasive species.

## How you can help

Despite the threats that light pollution poses to moths and their role in maintaining our ecosystems, there are several ways we can advocate for moths in our individual capacities.

- Firstly, assess outdoor lighting at your home or apartment and do your best to turn off any unnecessary lights. Shading your windows at night is also a good idea.
- Moths are considered to be more attracted to higher-frequency lights (generally with more UV output), so if you must use outdoor lighting at night for safety purposes, try to install low-voltage lights (such as sodium-vapor bulbs) and motion detectors.

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- LED lighting, though more energy efficient, is ironically more disruptive to moths than other options. If you are going to install LED lights, try to choose bulbs that emit warmer wavelengths instead of “daylight” bulbs.
- Plant for diurnal and nocturnal pollinators alike! As we know, moths tend to prefer fragrant flowers that are white or pale in coloration. Making sure to always lean towards plants that are native and non-invasive, try planting flowers like sacred Datura (*Datura wrightii*), morning glory (*Convolvulus* spp.), and common evening primrose (*Oenothera biennis*) to attract moths and provide them food and nectar sources. Reference our [eco-regional planting guides](#) for more ideas for pollinator-friendly plants.
- Reduce or eliminate the use of pesticides whenever possible and say no to bug zappers!

**Sources:**

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