

Artificial night lighting can impact bats and other wildlife. Although some lights attract insects (an important food source for the small microbats), bright lights in both cities and bushland areas may not be beneficial for all bats, and can make them more vulnerable to predators.

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Photo: stock.xchng/Bruno Barros



How artificial lighting affects wildlife

Artificial night lighting can have both positive and negative effects on wildlife. Many insect species are attracted to light in high densities, which makes foraging easier for bats and other animals that eat insects. In fact, areas with bright lights, such as over car yards or tennis courts, can be a good place to watch bats during warm weather. However, many species of animals including some birds, sea turtles and bats are adversely affected by brightly lit areas at night, which cause them to change their migration or feeding routes. This puts them at a much greater risk of death from predation for example by owls or cats, road kill, flying into buildings or sheer exhaustion from being disoriented.

How do bats respond to artificial lights?

Light from cities can infiltrate bushland, potentially making that habitat less suitable for slow flying bat species. However, the full consequences of nightlights to bats are only just starting to be explored. Here are two recent case studies:

1. Gould's Long-eared Bats avoid flood-lit bushland

Researchers studied Gould's Long-eared Bats (*Nyctophilus gouldi*) in Cumberland State Forest, a 40 hectare forest near Sydney which is now surrounded by brightly-lit suburbs and urban areas. They found that the bats were only using about 30 hectares of the forest for foraging, a very small area for these types of bats. The bats also spent all of their foraging time within the forest, with practically no use of the surrounding well-lit urban areas (containing residential, commercial and educational land uses). Within the forest, Gould's Long-eared Bats spent more time in dark open spaces, and avoided open areas exposed to artificial lighting from buildings and car parks. These long-eared bats are a slow-flying species, so they are probably more vulnerable to predators when they fly through well-lit areas.

In contrast, faster-flying species like Gould's Wattleed Bats (*Chalinolobus gouldii*) did spend time in these bright clearings. The areas the long-eared bats avoided were illuminated with an average of 24 lux (illumination), which is an unnatural amount of light and is over 200 times the light level of the full moon on a clear night.

2. Street lights can reduce the activity of some species, but have no effect on others

In another study, researchers observed long-eared bats along bushland edges in three different National Parks within western Sydney. These bats species also avoided bushland that was flooded with night lighting from adjacent streetlights, compared to bushland edges distant from lighting. However, other common bat species in the area were not affected by the lights, including Gould's Wattleed Bats and White-striped Freetail Bats (*Tadarida australis*), both of which are faster-flying species. In this study the lights long-eared bats were avoiding can produce up to 50 lux, making this habitat 500 times brighter than when lit by the full moon.

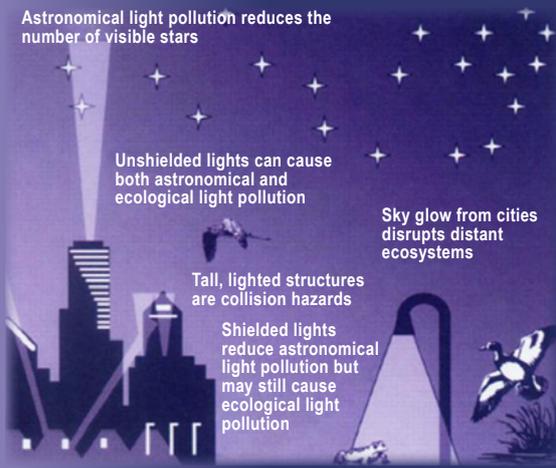
Gould's Long-eared Bat



Photo: Michael Pennay

As artificial night lighting increases, some bat species will become confined to smaller areas, because they won't fly through brightly lit areas that surround and connect their habitats and feeding areas.

Astronomical light pollution reduces the number of visible stars



Source: Longcore and Rich 2004

A bit about lights

Light is made of a spectrum of different wavelengths (e.g. infra-red, visible etc) and these different wavelengths affect different species of bats.

- Broad-spectrum white lights (i.e. lights that include a lot of the light spectrum) can attract more insects than globes that only use specific wavelengths, because a lot of energy is emitted from these lights in the ultraviolet spectrum. As a result these lights can attract fast flying bat species.
- Lights which use longer wavelengths, like orange and red lights, can be less attractive to faster flying bat species, but they are also less disruptive to other bats as well.
- However, very intense, high pressure lights, even the ones that use longer wavelengths including some street lights, can disrupt the commuting behaviour of slow flying bat species.

What lighting is best for urban bats?

To maintain the habitat value of small bushland patches and narrow corridors to slow-flying bat species, further research is required to develop 'bat friendly' practices. Future lighting design considerations for urban reserves and corridors include:



- Avoid installing lighting in or around bushland areas unless absolutely necessary. If lights cannot be avoided, consider using lower impact globes (described below) or lights with protective shields.
- Install shields on streetlights, to direct illumination downwards towards the street, reducing the spill-over into adjacent habitat.
- Use timers, sensors or motion detectors to switch lights on and off at appropriate times, reducing the length of time bushland is exposed to unnatural light levels.
- Ensure the impact of lighting on bats is considered in environmental impact statements for new developments.

- Choose light globes that will have the least impact on bat populations. Councils should place a high priority on replacing short wavelength globes (that emit fluorescent or ultraviolet light) with those that use longer wavelengths, especially in areas of high quality bat habitat, such as bushland. Low pressure lights that are more specific (rather than broad-spectrum), using longer wavelengths like orange and red should be the least disruptive.
- Install lights as low to the ground as possible, reducing the spill-over of light into adjacent areas.
- Increase tree and shrub cover in bushland and corridors as a buffer to reduce light penetration and improve the habitat value of these areas for slow flying bat species.



Photo: stock.xchng/safari11

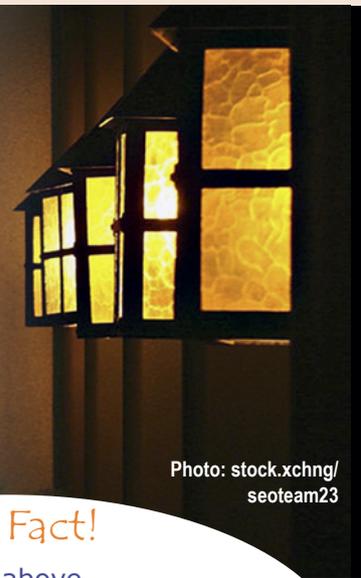


Photo: stock.xchng/seoteam23

Fun Fact!

Bright lights above tennis courts can be a good place to watch fast flying bats – sometimes they even swoop down to try and catch the tennis ball!"



Looking for more information about bats? Please see our fact sheets on a range of issues, available for download from:
www.ausbats.org.au

