

SCIENCE BRIEF

Losing darkness

What does it mean for bats?

Bats (pekapeka) are among Aotearoa New Zealand's most extraordinary taonga. They are our only native land mammals, and both surviving species are found nowhere else on Earth, but are now threatened with extinction.

Pekapeka are nocturnal, emerging after dark to feed, navigate and socialise.

The impact of artificial light on bats

Increasing use of artificial light at night is making Aotearoa New Zealand's night skies brighter. This is bad news for many native species, including pekapeka.¹

Historically, when bats emerged from their roosts at the end of twilight, they were only exposed to starlight and moonlight. Artificial light disrupts their natural behaviour. It can alter bats' flight paths, restrict access to roosts, and interfere with circadian cycles.²

In Aotearoa we know that artificial light at night can both reduce how often bats use an area and delay their arrival at lit sites by around two hours.³ This is not a minor inconvenience: two fewer hours of foraging, night after night, can affect survival and reproduction for a species that raises only one pup per year.

How can we better support pekapeka?

The good news is that the impact from artificial light on bats and other wildlife can be reduced without compromising safety or amenity values.

Modern technology can deliver necessary light, in the right place, at the right time, and with colours that are least harmful. Turn over to see how using Dark Sky International's principles for responsible outdoor lighting can reduce effects on bats.



Responsible lighting for bats



Useful

Use light only if it is needed

All light should have a clear purpose. Pekapeka are more likely to use dark places.³



Targeted

Direct light only where it is needed

Shielding and aiming light reduces spill and increases darkness for bats.



Less bright

No brighter than necessary

Using the lowest light level required reduces the impacts of artificial light at night.



Controlled

Use light only when it is needed

Use timers and motion sensors to reduce the amount of time the light is on.



Warm-coloured

Use warmer-colour lights

Limit blue, violet & UV (short wavelength) light to the least amount needed. Bats are less disrupted by amber light.³

Adapted from Dark Sky International and the Illuminating Engineering Society



Darkness



Amber light



Cool white light

Warmer-coloured lights are less disruptive for bats than cool white light, but darkness is best³

Helpful resources:

- [Australian National Light Pollution Guidelines for Wildlife](#) guides the assessment and management of light pollution impacts on bats (pages 86-100).
- [Eurobats guidelines for the consideration of bats in lighting projects](#) provides options for avoiding, mitigating and compensating adverse effects of lighting.
- Department of Conservation [Resources for bat workers: Bats/pekapeka](#) provides advice notes, best practice, and other information on how to support bats.

1. Cieraad E. & Farnworth B. (2023). [Lighting trends reveal state of the dark sky cloak: light at night and its ecological impacts in Aotearoa New Zealand](#). New Zealand Journal of Ecology, 47(1): 3559.
 2. Voigt, C.C., Azam, C., Dekker, J., Ferguson, J., M. Fritze, M., Gazaryan, S., Hölker, F., Jones, G., Leader, N., Lewanzik, D., Limpens, H.J.G.A., Mathews, F., Rydell, J., Schofield, H., Spoelstra, K., Zgarnajster, M. (2018). [Guidelines for consideration of bats in lighting projects](#). EUROBATs Publication Series No. 8. UNEP/EUROBATs Secretariat, Bonn, Germany, 62 pp.
 3. Schamhart, T., Borkin, K.M., Browne, C.M., Ling, N., Pattemore, D.E., Tempero, G.W. (2026). [Effects of nominal 2700 K amber LED with a blue cut filter and 4000 K white LED on nightly activity of light-naïve New Zealand long-tailed bats \(Chalinolobus tuberculatus\)](#). Mammalian Biology (2026).
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