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PRESS RELEASE

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British Ecological Society



Leibniz-Institut für Zoo-
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EVOLUTIONARY WILDLIFE RESEARCH FOR CONSERVATION

Light pollution impairs rainforest regeneration

Increasing light pollution in tropical habitats could be hampering regeneration of rainforests because of its impact on nocturnal seed-dispersers.

These new findings were reported by scientists from the German Leibniz Institute for Zoo and Wildlife Research Berlin (IZW). The study – *published in the British Ecological Society's Journal of Applied Ecology* – is the first to show that seed-dispersing bats avoid feeding in light-polluted areas.

Working with Sowell's short-tailed bats (*Carollia sowelli*), Daniel Lewanzik from the IZW gave the bats a simple choice. He divided a flight cage into two compartments. One was naturally dark and the other was illuminated by a sodium street lamp, the most common form of street lighting in the world. Inside both parts of the cage the bats were offered their favourite fruits to harvest: pepper plants, nightshade and figs.

The results revealed that bats flew into the dark compartment twice as often as the compartment lit by a street lamp. The bats also harvested fruits almost twice as often in the dark compartment.

In a second experiment Lewanzik illuminated pepper plants growing in



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the wild with a street light and measured the percentage of ripe fruit which bats harvested from plants in a dark location and from lit plants. While bats harvested 100 per cent of the marked, ripe fruit from the plants in the dark, only 78 per cent were taken from the lit plants. Although insect-eating bats have been shown to avoid foraging in light-polluted areas, this is the first study to show that fruit-eating bats also avoid lit areas.

This has important implications for forest regeneration in the tropics. Bats play a key role in pollinating plants and spreading their seeds, especially the seeds of species that are first to recolonise cleared land. “In tropical habitats bat-mediated seed dispersal is necessary for the rapid succession of deforested land because few other animals than bats disperse seeds into open habitats”, says Daniel Lewanzik, doctoral candidate at the IZW and first author of the study. Under naturally dark conditions, bats produce a copious 'seed rain' when defecating seeds while flying. By reducing foraging of fruit-eating bats in lit areas, light pollution is likely to reduce seed rain, he commented.

In many tropical countries, light pollution is increasing rapidly as economies and human populations grow. Natural succession of forests could therefore suffer as tropical habitats become increasingly illuminated. “The impact of light pollution could be reduced by changes in lighting design and by setting up dark refuges connected by dark corridors for light-sensitive species like bats,” Lewanzik says.

Publication:

Lewanzik D, Voigt CC (2014): Artificial light puts ecosystem services of frugivorous bats at risk. *Journal of Applied Ecology*.

[DOI: 10.1111/1365-2664.12206](https://doi.org/10.1111/1365-2664.12206).

Photos:

“Fledermaus_Carollia_sowellii_1_Autorin_Scheeberger_K_IZW.jpg”:

“Fledermaus_Carollia_sowellii_2_Autorin_Scheeberger_K_IZW.jpg”:



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Frugivorous bats (*Carollia sowelli*) in Costa Rica. Photo author:
Schneeberger K/IZW



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Links:

www.batlab.de

www.journalofappliedecology.org

Films:

<http://www.youtube.com/watch?v=1kb-So7sZmY&list=PLj2iBP9OyvXMhYlmhjiNOaxawagmJ7Pjo&index=17>

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Background information:

1. Sowell's short-tailed bat (*Carollia sowelli*) belongs to the large family of Phyllostomidae or leaf-nosed bats. The characteristic leaf like structure protruding upwards from their nose is believed to be involved in focusing the bats' ultrasonic biosonar beam more precisely. Their relatively broad wings allow them to fly slowly and to

manoeuvre elegantly within the dense forest. This is necessary since they mainly feed on fruit of pepper plants from the genus *Piper* that grow in the understory. These fruit are usually long and thin spikes that bats harvest on the wing and then eat it as humans eat corn on the cob.

2. The British Ecological Society was founded in 1913 and is the oldest ecological society in the world. A learned society and registered charity, the BES supports ecological science through its five academic journals, other publications, events, grants and awards. For more information visit www.britishecologicalsociety.org

The **Leibniz Institute for Zoo and Wildlife Research (IZW)** investigates the vitality and adaptability of wildlife populations in mammalian and avian species of outstanding ecological interest that face anthropogenic challenges. It studies the adaptive value of traits in the life cycle of wildlife, wildlife diseases and clarifies the biological basis and development of methods for the protection of threatened species. Such knowledge is a precondition for a scientifically based approach to conservation and for the development of concepts for the ecologically sustainable use of natural resources.

www.izw-berlin.de

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